S. HRG. 101-1072

B–2 BOMBER PROGRAM AND B–2 CONTRACT MANAGEMENT

HEARING

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

OCTOBER 11, 1990

Printed for the use of the Committee on Armed Services

U.S. GOVERNMENT PRINTING OFFICE

35-888 WASHINGTON : 1990

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

S201-2.

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B-2 BOMBER PROGRAM AND B-2 CONTRACT MANAGEMENT

THURSDAY, OCTOBER 11, 1990

U.S. SENATE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

The committee met, pursuant to notice, at 10:03 a.m., in room SR-222, Russell Senate Office Building, Senator Sam Nunn (chairman) presiding.

Committee members present: Senators Nunn, Exon, Levin, Dixon, Shelby, Warner, Thurmond, McCain, and Gorton.

Committee staff members present: Arnold L. Punaro, staff director and Andrew S. Effron, general counsel.

Professional staff members present: John J. Hamre, William E. Hoehn, Jr., David S. Lyles, Michael J. McCord, and Frederick F.Y. Pang.

Minority staff members present: Patrick A. Tucker, minority staff director and counsel; Brian D. Dailey, Judith A. Freedman, Ronald P. Kelly, George W. Lauffer, John E. Mansfield, and Durwood W. Ringo, Jr., professional staff members.

Staff assistants present: Lisa H. Kettlewell, Cindy Pearson, and Mickie Jan Wise.

Committee members' assistants present: Andrew W. Johnson, assistant to Senator Exon, Kenneth N. Luongo, assistant to Senator Levin, William J. Lynn, assistant to Senator Kennedy, Charles C. Smith, assistant to Senator Dixon, Milton D. Beach, assistant to Senator Glenn, Leon S. Fuerth, assistant to Senator Gore, Jefferson B. Seabright, assistant to Senator Wirth, Terence M. Lynch, assistant to Senator Shelby, C. Richard D'Amato and Melvin G. Dubee, assistants to Senator Byrd, James M. Bodner, assistant to Senator Cohen, Patrick F. McCartan, assistant to Senator Wilson, Anthony H. Cordesman assistant to Senator McCain, Robert M. Soofer, assistant to Senator Gorton, Charles G. Pearcy, assistant to Senator Lott, and Eric H. Thoemmes, assistant to Senator Coats.

OPENING STATEMENT OF SENATOR SAM NUNN, CHAIRMAN

Chairman NUNN. The Armed Services Committee will come to order. Our committee meets today to review with the Secretary of the Air Force, the Honorable Donald B. Rice, Jr., the validity of recent news articles about Northrop's management of the B-2 program and, at least by inference, Air Force lack of oversight of Northrop to the detriment of the taxpayers.

We have read all sorts of allegations that have come out and we deem them to be very serious charges. They come at a critical time in the B-2 program. Not only is this committee in conference with the House on the defense authorization bill, where the House bill would in effect cancel the B-2 program, but today, the Senate Appropriation Committee will mark up a defense appropriations bill. Probably by tomorrow we will be on the floor with that appropriation bill and will be voting on the B-2.

Thus, it is very important that the Air Force come forward and explain, for better or worse, the situation with regard to the B-2: the management of the program by the Air Force; the management of the program by Northrop; the progress on the B-2; the chances of it failing some of its tests; and whether it will meet its promise of low radar visibility—stealthy.

All those things are very important to us, and we think it is important that we hear from the Secretary of the Air Force this morning. I know the President himself is involved in this. I have talked to Secretary Cheney about it in the last day or two, and I am sure the Secretary of the Air Force has been in touch with them and can tell us the position of the administration this morning.

We are in the middle of conference, and I am going to have to be in and out. I am meeting with Congressman Aspin in a few minutes, and the Senate conferees are making certain proposals to the House in conference.

So, Mr. Secretary, I will be here as much as possible. I will be in and out. Senator Exon, who, as you well know, is chairman of our Strategic Subcommittee, will be presiding, and of course Senator Warner will be here, I am sure, as much as he can. He and I are both working in conference. Senator Thurmond, who is our ranking Republican on the Strategic Subcommittee, will be here, I am sure, for most of the hearing.

I would like to submit for the record at this time the prepared statements of Senator Exon and Senator Dixon.

[The prepared statements of Senator Exon and Senator Dixon follows:]

PREPARED STATEMENT BY SENATOR J. JAMES EXON

The committee will please come to order.

The committee meets today in open session to receive testimony on the B-2 program and on the latest allegations of mismanagement of that program by the prime contractor, the Northrop Corporation. At a hearing held on Tuesday, in the other legislative body, according to the lead paragraph of one of the press accounts—and I stress that I am quoting from a newspaper article:

"Top Air Force officials have charged that Northrop Corporation, which builds the B-2 'stealth' bomber and other expensive weapons systems is so poorly managed that it cannot account for the cost of many programs and has suffered major breakdowns in the production of every weapon the service reviewed." (End quote).

If this were true, if the Northrop Corporation really had no idea what programs cost, and if the Air Force in consequence has given then a blank check at the taxpayer's expense, then, like the savings and loan scandal, some people ought to be going to jail.

If it were indeed the case that the Air Force knowingly gave the taxpayers' defense dollars to a company that is as poorly managed as the news article suggests, then one of the leading candidates for, as the Monopoly board says, "Go directly to jail, Do not pass go," would be our distinguished witness for today's hearing—the Honorable Donald B. Rice, Jr., the Secretary of the Air Force. I will ask the report-

er to note for the record that I was smiling when I made my previous remark, and say welcome to you, again, Mr. Secretary; we await your testimony with considerable interest.

In a more serious vein, Mr. Secretary, let me note that the Northrop Corporation has been in the news from time to time, in an unfavorable light. Now I do not intend to malign Northrop, for, if we looked closely, we would find that there is scarcely a defense contractor anywhere in the land who has not been in the news for irregularities in contracting, for overcharging, and even, as Operation Ill Wind has shown, outright fraud and criminal behavior. But the question today is not so much "Can we trust Northrop?" as it is "Can the Air Force maintain adequate cost and performance oversight of Northrop and the B–2 program?"

Mr. Secretary, what the committee and the Nation needs today is a sober assessment of Northrop's management of the B–2 program and of the adequacy of the Air Force's oversight of Northrop. The B–2 is a very expensive airplane. Whether or not to continue the program is a critical issue between House and Senate conferees on the Defense Authorization bill which is in conference today. And both Appropriations Committees are moving forward on defense appropriations. Many of us have vigorously defended the B–2 program because we recognize it is a revolutionary technology. It is also a key element of the START Treaty which we hope will be before us next year for ratification. But no program, no matter how revolutionary, no matter how vital for START or for deterrence deserves our unqualified support. If the taxpayers are being continuously ripped off by the contractors, then it is our duty to demand restitution and to halt the program, or replace the contractors.

Mr. Secretary, we will hear from you in just a moment. But before we do that, let me recognize (Senator Warner/Senator Thurmond) for some opening remarks.

PREPARED STATEMENT BY SENATOR ALAN J. DIXON

Mr. Chairman, I have supported the B–2 stealth bomber program for many years, I am very concerned with the recent report from the Air Force indicating that this program is poorly managed.

This committee has been one of the strongest supporters for the B–2 bomber program, and I look forward to hearing from the Air Force today on it's report.

Thank you Mr. Chairman.

Chairman NUNN. So, Mr. Secretary, I will turn first to my colleague, Senator Warner, for any observations, and then to Senator Exon and Senator Thurmond, and then we will hear from you. We welcome you this morning.

Senator WARNER. Thank you, Mr. Chairman. Mr. Secretary, good morning. Yesterday, when Chairman Nunn and I spoke to you by telephone, we left a very clear impression that this committee, the majority at the moment is on record as supporting the B–2 program.

Speaking for myself, as a part of that majority, this is the one instrument of our whole deterrent that the Soviets cannot fully figure out and fully assess; and as we look in the years to come, that bomber, sitting on a strip here in the United States, will make it so complex that the Soviet planner cannot turn to a head of Government to a head of State in the Soviet Union and say, we can go for it.

So it is essential that this program go forward, and it is essential, however, that you clarify for us today, because we are within the next 48 hours, as the chairman may have stated here, prepared to try and get in conference a resolution of this B–2 issue in order to keep this program going.

This morning, each of us has received a letter from the President of the United States who states unequivocally the need for this program for the United States, and if I may, Mr. Chairman, read a paragraph or two here——

Chairman NUNN. I would go ahead and read the entire letter. I think it would be appropriate.

Senator WARNER. He addresses it to me, but it is addressed also to other members of this committee:

"As you continue the conference on the Fiscal Year 1991 Defense Authorization bill, I want to make clear the importance I place on the B–2 bomber, and my strong support for its continued production and deployment. While we are witnessing truly historic changes in the international environment, these changes have not obviated the need for a credible and effective nuclear deterrent. Soviet strategic modernization continues, and there remains a fundamental requirement for the B–2.

"The long range, penetrating bomber is the most flexible and the most stabilizing element of the strategic triad, and the only one that is applicable across the full spectrum of possible conflict. The B–52 is approaching the end of its useful life. B–1B was expressly brought to bridge the gap between B–52 and the B–2 bomber. I am convinced that the United States should proceed with the B–2.

"We have made considerable progress in the strategic arms talks. The B–2 is integral to our force plan under the START Treaty. The key goal in these talks is to move the strategic forces of the United States and the Soviet Union toward the greater stability offered by manned bomber.

"Clearly, stealth technology ranks among the most important military developments since World War II. The B–2 represents a revolution in aircraft technology, not just an evolutionary change. It will offset a major investment by our potential adversaries while minimizing the requirements for a large force structure of our own, and we lead the world in this technology. We must maintain this lead and deploy the B–2.

"I fully understand the fiscal constraints under which you are attempting to fashion a sound and supportable defense authorization bill. However, I have no doubt in the requirement for the B–2. I ask that you join me in a shared commitment to deploy the B–2, and urge your continued leadership for the B–2 as a vital part of our strategic modernization programs."

I hope, Mr. Secretary, in your testimony this morning, you will allude to your understanding, which is shared here in the Congress, of how the Soviet Union, despite the dramatic occurrences in Eastern Europe and the receding threat, continues without any abatement, without any lessening of its strategic modernization program, particularly in its mobile missile—land-based mobile missile, both road and rail systems.

Given that state of fact, it is imperative that the United States likewise continue its modernization of its triad, and if we do not continue the B–2, we will have to eventually face the fact that no longer is our deterrent predicated on a triad for its effect.

Thank you.

Chairman NUNN. Thank you, Senator Warner. Senator Thurmond, as ranking member on the Strategic Subcommittee, do you have any opening remarks?

Senator THURMOND. Thank you, Mr. Chairman. Mr. Chairman, I welcome this hearing at this point in our deliberations on the de-

fense authorization bill, although I had hoped our joint conference would have been completed by this time.

Today's hearing may be helpful in resolving one of the major sticking points of the conference. I expect, I was not the only one caught by surprise as I read the press accounts of the Air Force's probe of the Northrop Corporation. Although it is ironic the result of the probe surfaced at this critical time, I welcome it. We need all available information to make a rational decision on whether or not to proceed with the B–2 program.

Mr. Secretary, I hope your statement will clearly address the impact the Air Force's findings have on the B–2 program. We need to know if there is any doubt in your mind on whether or not the findings have any relevance on the quality of the B–2 or its capabilities. We need to know if these problems can be corrected in time to meet the timeliness that both the Air Force and the Congress have established for the B–2 program.

Although I cannot condone mismanagement, I believe similar problems exist in other companies. I am confident that many of my colleagues on this committee have read articles on mismanagement at other aerospace companies. The difference in this case is that Northrop builds the B–2, which is a lightning rod for bad news.

Despite "sticker shock," I support the B–2 program because I believe our Nation needs to modernize its strategic bomber force. Unless there is proof of criminal intent, we ought to let the Air Force and Northrop work together to solve the management problems. We can correct the management errors. We may not recover from our failure to update our strategic bomber deterrence.

Secretary Rice, I join the members of the committee in extending you a warm welcome, and look forward to hearing your side of the story.

Thank you, Mr. Chairman.

Senator SHELBY [presiding]. Mr. Secretary, I understand you are not this morning going to get into the integrity of what is going on, but a lot of people in Congress and elsewhere in their mind link performance and integrity because of all the other problems. I realize from your statement that there is an ongoing investigation separate and apart from performance and the problems inherent in management.

When will some of those reports be forthcoming, and will you appear before this committee if asked to explain all that?

Secretary RICE. Certainly, Senator Shelby. I or other Air Force witnesses will be happy to come to the committee to explain the results of those reviews. They are ongoing at this time. We do not have a fixed time for their completion, but we are hopeful that they can be wound up in the next few months.

Senator SHELBY. In the public's mind, they see a lot of integrity problems and they ask if this is linked to performance. I do not know whether it is. Maybe it is not. Integrity of the system is so important and central to the whole performance of the Congress in backing these weapons systems, as you know.

Secretary RICE. You are absolutely right, sir, and that is why we are taking that side of the investigation very seriously, indeed. We will, of course, be pleased to relate the results of it when it is completed.

Senator SHELBY. That is all I have to say.

Mr. Secretary, do you want to go ahead and proceed with your statement?

STATEMENT OF HON. DONALD B. RICE, SECRETARY OF THE AIR FORCE

Secretary RICE. Mr. Chairman and members of the committee, in my opening statement today I want to address two fundamental points concerning the recent Air Force review of the Northrop Corporation and its management. This review has received much publicity in the past few days.

First, the review needs to be understood and considered carefully within the context of its appropriate place in the overall process of Air Force and Department of Defense management of acquisition programs and our monitoring of contractor performance. This particular review was requested by my service acquisition executive, Mr. John J. Welch, Jr., and led by Brig. Gen. Robert Drewes who is here today.

It provided useful information about where Northrop was in implementing improvements in its management and technical processes in the May-June time frame of this year. In my view, it is neither devastating, as some have characterized it, nor is it a good news story. It is a sincere effort by the Air Force with the full cooperation of the Northrop Corporation to identify cross-cutting problems that need corporate attention and to implement needed solutions. The review is one tool in an ongoing process. It is not an end product in itself.

The second major point is that the review is not a basis for decisions about the B-2 aircraft or any other weapons system program for which Northrop is the prime or subcontractor. It would be both inappropriate and unwise to use the review or briefings and publicity concerning it for that purpose. Weapons systems must continue to be judged on the basis of the threat, the operational need, the substantive technical progress that is occurring in that specific program, the testing and how those results are coming, and the cost and affordability issues associated with each program.

This was done in the case of the B-2 during the major aircraft review conducted by the Secretary of Defense that was reported to you last April. There is nothing in this Air Force Systems Command management review that could reasonably serve as the sole or primary basis for making programmatic or funding decisions concerning individual programs.

In particular, I believe that a fair consideration of all the available technical and programmatic information on the B-2 leads to the conclusion that, if authorized and funded, the B-2 program will continue to be executed in a creditable manner and result in a vital capability in our strategic and conventional warfighting forces.

Let me begin by putting the review of the Northrop Corporation in context. The Air Force acquisition executive, Jack Welch, was concerned early on in his tenure with a number of problems in Northrop programs. In the fall of 1987 he held the first of a series of meetings with Northrop management to point out and discuss

his concerns and to motivate management actions. He has personally reviewed program and management system status with Northrop top management on many occasions, using reports of the plant representative officers and the Air Force program managers involved as well as his personal observations.

I held a review myself of Northrop performance on several programs with the top management and several outside directors of the Northrop Corporation shortly after coming aboard as Air Force Secretary.

As Mr. Welch continued this process and made or recommended key decisions on Northrop programs, he began to see indications of common problems, similar programs that seemed to cut across Northrop divisions and programs. In May of this year he requested that Air Force Systems Command conduct a review to identify Northrop common performance problems, try to determine root causes, assess Northrop's corrective actions to date at the corporate level, and suggest lessons learned from that experience that might be applied in the case of other contractors.

His purpose was to gain information as part of an ongoing process and to bring focus on the key problems needing corporate level attention in order to improve management processes themselves.

The review itself included only certain Air Force programs. Because it looked across the corporation, it did not attempt to draw conclusions about any particular program. The review included examination of a variety of status reports submitted in recent years by our program directors and by the plant representatives, interviews of program directors, plant representatives and their staffs, reviews of company records, and interviews with corporate staff and managers of four of the five divisions and the corporate chief executive officer at Northrop.

There is general agreement between Mr. Welch and the Northrop chief executive officer, Mr. Kent Kresa, that the findings of the review are valid and accurately stated when understood from the briefing presented to them by General Drewes.

This review did not include examination of the ethics and integrity issues that have resulted in the lengthy suspension from government contractor of the Northrop Precision Products Division, nor did it delve into other ongoing investigations being conducted under the purview of the Department of Justice with support of Department of Defense staffs. These matters are being handled by the Air Force Debarment and Suspension Review Board and appropriate investigative agencies and attorneys.

I assure you that these important matters are receiving separate continuing attention by top management in the Department of Defense both in the Air Force and the Office of the Secretary of Defense.

Before I briefly summarize the review's findings concerning problem areas, corrective actions and further actions needed, I consider it important to point out that problems can be expected in any large complex human endeavor. There are few endeavors that match the development and production of high technology state-of-the-art weapons systems in complexity or in scope. Management problems not unlike those at Northrop are found to some degree at

most major weapons systems contractors, and we are finding it necessary to work intensively with several of them at this very time.

The situation at Northrop was and is of concern to the Air Force because of the degree and pervasiveness of the problems and also because of the challenges inherent in the advanced high technology involved in several Northrop programs.

In addition, it should be noted that since the early 1980s, Northrop has more than tripled its annual sales volume and changed from being primarily a subcontractor to a prime contractor on several large systems. Rapid growth and change created management challenges which in some cases have not yet been fully met and will require constant attention and follow-through by both corporate and Air Force managers.

The review found problems in six general areas of performance on Air Force contracts but also identified corrective action started in recent months by the company. Systems engineering includes managing the interfaces between discreet segments of engineering such as avionics and flight control systems. The review found some recurring problems in systems engineering; for example, in control of design changes.

The review also noted, however, a number of recent improvement steps by the company. These include directives mandating use of systems engineering principles and training on these principles in the B–2 division. More effort is needed to implement the policy and provide those skills in all the divisions at Northrop, and the company has committed to that further progress.

Transition to production involves the efficient coordination of engineering and manufacturing, moving a program forward from the design phase into a manufacturing operation. Deficiencies were found in this process. Northrop is redefining roles of its key personnel in this area. More work is needed, however, to provide closer corporate level scrutiny, and the company has committed to do that as well.

Software management is another problem area which is certainly not one unique to Northrop. In fact, it pervades the entire industry. Progress has been made. Work on the B–2 has generally gone well. The company seeks to become a world- class software producer, and we certainly hope they succeed at that.

Subcontract management involves effective communication of requirements and continuous status checks between Northrop, the prime contractor, and its team of subcontractors. The review found a need for improving these relationships and recognized that Northrop had been working to improve here also. However, greater corporate level emphasis was deemed to be needed.

In the matter of business systems, the review found that in recent years Northrop has had problems in areas such as cost estimating and property management systems. Corrective action plans had been implemented in response to prior government surveillance, and these systems are now approved by the Government. However, continuing work is needed and expected by the company to keep them that way.

Finally, regarding organization and personnel, the company had not in earlier times been taking full advantage of all of its corporate resources, nor of bringing in talent from outside of the organi-

zation at the right time. In addition, there had been little crossfeed of information between Northrop divisions which might have facilitated problem avoidance or resolution. Today we see some key managers being hired into the company from outside and find much greater inter-divisional information and resource sharing.

In summary, what this review showed as a company suffering the growing pains of accelerated growth in business volume while attempting to accomplish a number of very complex tasks. Certainly we would have preferred that many of these issues had been addressed more effectively earlier. However, we are pleased now to see demonstrations of significant change in several aspects of Northrop operations and a commitment to resolve those problems which had not yet been addressed.

Since October 1987 nearly 60 percent of Northrop's top executives have left the company. We believe this change, on net, has been necessary and healthy for Northrop performance. The new corporate leadership is exerting stronger overall direction and control. Excess assets have been sold and resource centers of excellence, such as computer and payroll centers, are being established to reduce overhead.

I do not mention these matters to defend the company but to add a measure of balance to the understanding of the review's findings. The reviewers did not see sterling examples of management performance in contracts with Northrop. However, they did see some very positive steps in the right direction. Where they focused on the need for further improvement, Northrop has been fully cooperative.

Upon completion, the review was briefed to Mr. Welch and other key Air Force managers in mid-July. It was briefed to Mr. Kresa, the Northrop CEO, on July 24, with Mr. Welch present. Since then, Mr. Welch has had detailed discussions with Mr. Kresa about Northrop's management actions to ensure full implementation of ongoing improvements and to develop plans for further improvements. This process is far from over. Mr. Welch expects to remain engaged with Northrop management on these problems on a continuing basis.

The review was also presented to the staff of the Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce. This was done at the request of Chairman Dingell on September 21. On the 9th of October, the review was the subject of an open hearing conducted by that subcommittee.

The Air Force was concerned, and remains concerned, that detailed public discussion of the review's findings in the forum of a hearing cannot provide the proper context and a balanced understanding of the review. We believe that this review is a good example of the very kind of government oversight and improvement efforts that the Congress and the public should approve and support. This is exactly what we all should expect our government acquisition managers are doing in the interest of the taxpayer.

We also believe that such reviews, however, are more productive and effective if they can be accorded some degree of confidentiality. We are concerned that the public discussion and resultant out-of-context publicity may impede further efforts with Northrop and other contractors to conduct similar reviews.

I will now turn to the B–2 program itself. First, I would like to relate the review to the B–2 division at Northrop. In many ways, the Northrop B–2 division has been leading the way in improved operations at Northrop. An experienced senior executive was hired from outside the corporation to head this division.

The B–2 division has an approved systems engineering master plan. Weekly meetings are held between engineering and manufacturing departments to work transition to production issues. Systems engineering training has been conducted. The division general manager has been personally working to improve subcontractor issues and relationships. And that division has, at times, used the resources of other Northrop divisions to get past temporary problems in that program. So progress is being made and the company is showing its commitment to the B–2 program's success.

In terms of weapon systems procurement, from a government acquisition management point of view, the B–2 should serve as an example of how the next generation of advanced aircraft must be produced. This is not to say that the development of the B–2 has not had its share of problems, but, rather, that the acquisition approach has been structured to identify potential problems early to reduce the risk. There are three specific areas where this acquisition approach is best exemplified—risk reduction, laboratory testing, and producibility.

Since early 1980, there has been an aggressive effort to minimize risks associated with the technologies that are important to the B–2 yet are not quite mature. The risk reduction effort is embodied in over one-half million test hours. Early efforts in the manufacturing of larger-scale composites and the tools necessary to mass produce these sections have greatly reduced touch labor, thereby minimizing defects. Advances in the construction of low observable materials have reduced manufacturing costs.

As the aircraft design took shape, every major component or subsystem was extensively tested in a laboratory environment. Nine separate laboratories were utilized, such as the flight control and hydraulic integration laboratory. This laboratory consisted of the entire flight control system, to include hydraulic lines, flight control surface actuators, computers and pumps. This exact ground simulator of the flight control system was used extensively to develop the flight control software prior to installation on the aircraft.

Because the B–2's performance is so dependent upon the radar and navigation systems, a flying test bed, a KC–135, is utilized in the development of these two systems. Finally, extensive sub-scale aircraft and full-scale components have been tested on indoor and outdoor radar ranges. Over 30,000 hours of radar cross-section testing has greatly enhanced the understanding of the aircraft's radar signature.

The extensive risk reduction efforts have not only benefited the basic aircraft engineering, but have also enhanced the manufacturing of the B–2. The B–2 represents the first total practical application of a variety of advances in manufacturing technologies. It has pioneered the total integration of computer-aided design, engineering, manufacturing, logistics support, business integration, and product data exchange technologies.

Sensor-equipped adaptive tools, such as drills, which were previously unavailable but are critical when working with multi-layered composites, were developed from within the B–2 program. A computer-aided design/computer-aided manufacturing system linked to the major manufacturing centers greatly reduced the need for mockups and prototyping. The introduction of many automated tools for high-speed production substantially reduced times required for manufacturing operations.

The success of 10 years of risk reduction, lab testing, and manufacturing technology enhancements is best highlighted by the early flight test results. The accomplishments to date on the B–2 flight test program are best summarized from the recent Defense Science Board review.

"From the results of Block 1 testing that we have seen, we note no technical or performance problems that would lead us to challenge range and payload performance expectations for the B–2. Nor have we observed any flightworthiness or aerodynamic problems that give us cause for program caution."

This view is shared by Dr. Robert Duncan, Director of Operational Test and Evaluation in the Office of the Secretary of Defense. To quote from his review: "From the data we have assessed, there does not appear to be any significant aerodynamic or airworthiness hurdles to overcome that would conflict with the operational expectations of the B–2. The engines and associated systems have performed extremely well. The ease of performing B–2 air refueling is a testimony to its excellent flying qualities."

In summary, we are well along on a structured, orderly development process using innovative design and advanced production methods. The aircraft is meeting program requirements and has fared well in independent reviews.

Mr. Chairman, at the beginning of my statement I cited the importance of considering the Air Force review of Northrop Corporation within the appropriate context. I hope that my testimony here today will help to provide the committee with a balanced view. The Air Force will stay engaged with Northrop at the service acquisition executive level through our program directors and program executive officers and through the defense plant representatives to insure continuous improvement.

I also continue to call attention to the fact that programs that offer step improvements in our military capabilities will have risks throughout their lifetimes. It is our job to manage these risks by the prudent balance of performance, cost, and schedule. We will continue to give this committee and all of the involved Members of Congress and their staffs current actuals and current forecasts on each parameter of program measurement throughout the life of this program.

I also said that the review is not and should not be used as a basis for programmatic or funding decisions on the B–2 or other programs. I have summarized some of the strong points of the B–2 program and quoted some independent views that support its outstanding technical progress in development and testing.

I strongly urge this committee and all Members of the Senate and House of Representatives to support continued authorization

and appropriation of the B–2 program which will provide vital deterrent and warfighting capabilities for many years to come.

Mr. Chairman, that completes my formal opening statement. With your permission, I should like also to offer for the record the statement that Brigadier General Drewes made to the Subcommittee on Oversight and Investigations in the House.

Senator EXON [presiding]. Without objection, that will be included in the record.

Secretary RICE. You have, I believe, already received the letters dated this morning from the President of the United States on his views of the importance of the B–2 program.

With that, I stand ready for your questions, sir.

[The prepared statements of Secretary Rice and Brigadier General Drewes follow:]

STATEMENT BY

HONORABLE DONALD B. RICE

SECRETARY OF THE AIR FORCE

MR CHAIRMAN AND MEMBERS OF THE COMMITTEE, IN MY OPENING STATEMENT TODAY, I WANT TO ADDRESS TWO FUNDAMENTAL POINTS CONCERNING THE RECENT AIR FORCE REVIEW OF THE NORTHROP CORPORATION. THIS REVIEW HAS RECEIVED MUCH PUBLICITY IN THE PAST FEW DAYS. FIRST, THE REVIEW NEEDS TO BE UNDERSTOOD AND CAREFULLY CONSIDERED WITHIN THE CONTEXT OF ITS PROPER PLACE IN THE OVERALL PROCESS OF AIR FORCE AND DOD MANAGEMENT OF ACQUISITION PROGRAMS AND OUR MONITORING OF CONTRACTOR PERFORMANCE. THIS REVIEW WAS REQUESTED BY MY SERVICE ACQUISITION EXECUTIVE, MR JOHN J. WELCH, JR. AND LED BY BRIGADIER GENERAL ROBERT W. DREWES. IT PROVIDED USEFUL INFORMATION ABOUT WHERE NORTHROP WAS IN IMPLEMENTING IMPROVEMENTS IN ITS MANAGEMENT AND TECHNICAL PROCESSES IN THE MAY/JUNE TIME FRAME. IN MY VIEW, IT IS NEITHER DEVASTATING, AS SOME HAVE CHARACTERIZED IT, NOR A GOOD NEWS STORY. IT IS A SINCERE EFFORT BY THE AIR FORCE WITH THE FULL COOPERATION OF THE NORTHROP CORPORATION TO IDENTIFY CROSS-CUTTING PROBLEMS THAT NEED CORPORATE ATTENTION AND TO IMPLEMENT NEEDED SOLUTIONS. THE REVIEW IS ONE TOOL IN AN ONGOING PROCESS, NOT AN END PRODUCT.

THE SECOND MAJOR POINT IS THAT THE REVIEW IS NOT A BASIS FOR DECISIONS ABOUT THE B-2 AIRCRAFT OR ANY OTHER WEAPONS SYSTEM PROGRAM FOR WHICH NORTHROP IS THE PRIME OR A SUBCONTRACTOR. IT WOULD BE BOTH INAPPROPRIATE AND UNWISE TO USE THE REVIEW, OR BRIEFINGS AND PUBLICITY CONCERNING IT FOR THAT PURPOSE. WEAPON SYSTEMS MUST CONTINUE TO BE JUDGED ON THE BASIS OF THE THREAT, OPERATIONAL NEED, SUBSTANTIVE TECHNICAL PROGRESS, TESTING, AND COST AND AFFORDABILITY. THIS WAS DONE IN THE B-2 MAR THAT WAS REPORTED TO YOU IN APRIL. THERE IS NOTHING IN THE REVIEW THAT COULD REASONABLY SERVE AS THE SOLE OR PRIMARY BASIS FOR MAKING PROGRAMMATIC OR FUNDING DECISIONS CONCERNING PROGRAMS.

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IN PARTICULAR, I BELIEVE THAT A FAIR CONSIDERATION OF ALL OF THE AVAILABLE TECHNICAL AND PROGRAMMATIC INFORMATION ON THE B-2 LEADS TO THE CONCLUSION THAT, IF AUTHORIZED AND FUNDED, THE B-2 PROGRAM WILL CONTINUE TO BE EXECUTED IN A CREDITABLE MANNER AND RESULT IN A VITAL CAPABILITY IN OUR STRATEGIC AND CONVENTIONAL WAR FIGHTING FORCES.

LET ME BEGIN BY PUTTING THE REVIEW OF THE NORTHROP CORPORATION IN CONTEXT. THE AIR FORCE SERVICE ACQUISITION EXECUTIVE, JACK WELCH, WAS CONCERNED EARLY WITH A NUMBER OF PROBLEMS IN NORTHROP PROGRAMS. IN THE FALL OF 1987, HE HELD THE FIRST OF A SERIES OF MEETINGS WITH NORTHROP MANAGEMENT TO POINT OUT AND DISCUSS HIS CONCERNS AND TO MOTIVATE MANAGEMENT ACTIONS. HE HAS PERSONALLY REVIEWED PROGRAM AND MANAGEMENT SYSTEM STATUS WITH NORTHROP TOP MANAGEMENT ON MANY OCCASIONS USING REPORTS OF THE PLANT REPRESENTATIVE OFFICES AND THE PROGRAM MANAGERS INVOLVED, AS WELL AS HIS PERSONAL OBSERVATIONS. I HELD A REVIEW MYSELF OF NORTHROP PERFORMANCE ON SEVERAL PROGRAMS WITH THE TOP MANAGEMENT AND SEVERAL OUTSIDE DIRECTORS OF NORTHROP SHORTLY AFTER COMING ABOARD AS AIR FORCE SECRETARY.

AS MR WELCH CONTINUED THIS PROCESS AND MADE OR RECOMMENDED KEY DECISIONS ON NORTHROP PROGRAMS, HE BEGAN TO SEE INDICATIONS OF COMMON PROBLEMS THAT CUT ACROSS NORTHROP DIVISIONS AND PROGRAMS. IN MAY 1990 HE REQUESTED THAT AIR FORCE SYSTEMS COMMAND CONDUCT A REVIEW TO IDENTIFY NORTHROP COMMON PERFORMANCE PROBLEMS, DETERMINE ROOT CAUSES, ASSESS NORTHROP'S CORRECTIVE ACTIONS TO DATE AT THE CORPORATE LEVEL, AND SUGGEST LESSONS LEARNED. HIS PURPOSE WAS TO GAIN INFORMATION, AS PART OF AN ONGOING PROCESS, AND TO BRING FOCUS ON THE KEY PROBLEMS NEEDING CORPORATE LEVEL ATTENTION IN ORDER TO IMPROVE MANAGEMENT PROCESSES.

THE REVIEW, ITSELF, INCLUDED ONLY CERTAIN AIR FORCE PROGRAMS.

BECAUSE IT LOOKED ACROSS THE CORPORATION, IT DID NOT ATTEMPT TO DRAW CONCLUSIONS ABOUT ANY PARTICULAR PROGRAM. THE REVIEW INCLUDED EXAMINATION OF A VARIETY OF STATUS REPORTS SUBMITTED IN RECENT YEARS BY PROGRAM DIRECTORS AND PLANT REPRESENTATIVES; INTERVIEWS OF PROGRAM DIRECTORS, PLANT REPRESENTATIVES AND THEIR STAFFS; REVIEWS OF COMPANY RECORDS; AND INTERVIEWS WITH CORPORATE STAFF AND MANAGERS OF FOUR OF THE FIVE DIVISIONS AND THE CORPORATE CHIEF EXECUTIVE OFFICER. THERE IS GENERAL AGREEMENT BETWEEN MR WELCH AND THE NORTHROP CEO, MR KENT KRESA, THAT THE FINDINGS OF THE REVIEW ARE VALID AND ACCURATELY STATED WHEN UNDERSTOOD FROM THE BRIEFING PRESENTED TO THEM BY GENERAL DREWES.

THIS REVIEW DID NOT INCLUDE EXAMINATION OF THE ETHICS AND INTEGRITY ISSUES THAT HAVE RESULTED IN THE LENGTHY SUSPENSION FROM GOVERNMENT CONTRACTING OF THE NORTHROP PRECISION PRODUCTS DIVISION, NOR DID IT DELVE INTO OTHER ONGOING INVESTIGATIONS BEING CONDUCTED UNDER THE PURVIEW OF THE DEPARTMENT OF JUSTICE WITH SUPPORT OF DOD STAFFS. THESE MATTERS ARE BEING HANDLED BY THE AIR FORCE DEBARMENT AND SUSPENSION REVIEW BOARD AND APPROPRIATE INVESTIGATIVE AGENCIES AND ATTORNEYS. I ASSURE YOU THAT THESE IMPORTANT MATTERS ARE RECEIVING SEPARATE, CONTINUING ATTENTION BY TOP MANAGEMENT, BOTH IN THE AIR FORCE AND THE OFFICE OF THE SECRETARY OF DEFENSE.

BEFORE I BRIEFLY SUMMARIZE THE REVIEW'S FINDINGS CONCERNING PROBLEM AREAS, CORRECTIVE ACTIONS, AND FURTHER ACTIONS NEEDED, I CONSIDER IT IMPORTANT TO POINT OUT THAT PROBLEMS CAN BE EXPECTED IN ANY LARGE, COMPLEX HUMAN ENDEAVOR. THERE ARE FEW ENDEAVORS THAT MATCH THE DEVELOPMENT AND PRODUCTION OF HIGH TECHNOLOGY, STATE-OF-THE-ART WEAPONS SYSTEMS IN COMPLEXITY OR IN SCOPE. MANAGEMENT PROBLEMS NOT UNLIKE THOSE AT NORTHROP ARE FOUND TO SOME DEGREE AT MOST MAJOR WEAPON SYSTEMS CONTRACTORS AND WE ARE FINDING IT NECESSARY TO WORK INTENSIVELY WITH SEVERAL OF THEM. THE

SITUATION AT NORTHROP WAS AND IS OF CONCERN TO THE AIR FORCE BECAUSE OF THE DEGREE AND PERVASIVENESS OF THE PROBLEMS AND ALSO BECAUSE OF THE CHALLENGES INHERENT IN THE ADVANCED, HIGH TECHNOLOGY INVOLVED IN SEVERAL NORTHROP PROGRAMS.

IN ADDITION, IT SHOULD BE NOTED THAT SINCE THE EARLY 1980's, NORTHROP HAS MORE THAN TRIPLED ITS ANNUAL SALES VOLUME AND CHANGED FROM BEING PRIMARILY A SUBCONTRACTOR TO A PRIME CONTRACTOR ON SEVERAL LARGE SYSTEMS. RAPID GROWTH AND CHANGE CREATED MANAGEMENT CHALLENGES WHICH IN SOME CASES HAVE NOT YET BEEN FULLY MET AND WILL REQUIRE CONSTANT ATTENTION AND FOLLOW-THROUGH BY BOTH CORPORATE AND AIR FORCE MANAGERS.

THE REVIEW FOUND PROBLEMS IN SIX GENERAL AREAS OF PERFORMANCE ON AIR FORCE CONTRACTS, BUT ALSO IDENTIFIED CORRECTIVE ACTIONS STARTED IN RECENT MONTHS BY THE COMPANY.

SYSTEMS ENGINEERING INCLUDES MANAGING THE INTERFACES BETWEEN DISCRETE SEGMENTS OF ENGINEERING SUCH AS AVIONICS AND FLIGHT CONTROL SYSTEMS. THE REVIEW FOUND SOME RECURRING PROBLEMS IN SYSTEMS ENGINEERING; FOR EXAMPLE, IN CONTROL OF DESIGN CHANGES. HOWEVER, THE REVIEW ALSO NOTED A NUMBER OF RECENT IMPROVEMENT STEPS BY THE COMPANY. THESE INCLUDE DIRECTIVES MANDATING USE OF SYSTEMS ENGINEERING PRINCIPLES AND TRAINING ON THESE PRINCIPLES IN THE B-2 DIVISION. MORE EFFORT IS NEEDED TO IMPLEMENT THE POLICY AND PROVIDE THE SKILLS IN ALL DIVISIONS. THE COMPANY HAS COMMITTED TO FURTHER PROGRESS.

TRANSITION TO PRODUCTION INVOLVES THE EFFICIENT COORDINATION OF ENGINEERING AND MANUFACTURING, MOVING A PROGRAM FORWARD FROM THE DESIGN PHASE INTO A MANUFACTURING OPERATION. DEFICIENCIES WERE FOUND IN THIS PROCESS. NORTHROP IS REDEFINING ROLES OF ITS KEY PERSONNEL IN THIS AREA. HOWEVER, MORE WORK IS NEEDED TO

PROVIDE CLOSER, CORPORATE-LEVEL SCRUTINY AND THE COMPANY HAS COMMITTED TO DO SO. .

SOFTWARE MANAGEMENT IS ANOTHER PROBLEM AREA, ONE WHICH IS NOT UNIQUE TO NORTHROP. IN FACT, IT PERVADES THE ENTIRE INDUSTRY. PROGRESS HAS BEEN MADE. WORK ON THE B-2 HAS GENERALLY GONE WELL. THE COMPANY SEEKS TO BECOME A WORLD CLASS SOFTWARE PRODUCER, AND WE HOPE THEY SUCCEED.

SUBCONTRACT MANAGEMENT INVOLVES EFFECTIVE COMMUNICATION OF REQUIREMENTS AND CONTINUOUS STATUS CHECKS BETWEEN NORTHROP, THE PRIME CONTRACTOR, AND ITS TEAM OF SUBCONTRACTORS. THE REVIEW FOUND A NEED FOR IMPROVING THESE RELATIONSHIPS AND RECOGNIZED THAT NORTHROP HAD BEEN WORKING TO IMPROVE HERE ALSO. HOWEVER, GREATER CORPORATE LEVEL EMPHASIS IS NEEDED.

IN THE MATTER OF BUSINESS SYSTEMS, THE REVIEW FOUND THAT IN RECENT YEARS NORTHROP HAS HAD PROBLEMS IN AREAS SUCH AS COST ESTIMATING AND PROPERTY MANAGEMENT SYSTEMS. CORRECTIVE ACTION PLANS HAD BEEN IMPLEMENTED IN RESPONSE TO PRIOR GOVERNMENT SURVEILLANCE AND THESE SYSTEMS ARE NOW APPROVED. HOWEVER, CONTINUING WORK IS NEEDED AND EXPECTED BY THE COMPANY TO KEEP THEM THAT WAY.

FINALLY, REGARDING ORGANIZATION AND PERSONNEL, THE COMPANY HAD NOT BEEN TAKING FULL ADVANTAGE OF ALL ITS CORPORATE RESOURCES, NOR OF BRINGING IN TALENT FROM OUTSIDE OF THE ORGANIZATION AT THE RIGHT TIME. IN ADDITION, THERE HAD BEEN LITTLE CROSSFEED OF INFORMATION BETWEEN NORTHROP DIVISIONS WHICH MIGHT HAVE FACILITATED PROBLEM AVOIDANCE OR RESOLUTION. TODAY WE SEE SOME KEY MANAGERS BEING HIRED INTO THE COMPANY AND FIND MUCH GREATER INTERDIVISIONAL INFORMATION AND RESOURCE SHARING.

IN SUMMARY, WHAT THIS REVIEW SHOWED WAS A COMPANY SUFFERING THE GROWING PAINS OF ACCELERATED GROWTH IN BUSINESS VOLUME WHILE ATTEMPTING TO ACCOMPLISH A NUMBER OF VERY COMPLEX TASKS. CERTAINLY, WE WOULD HAVE PREFERRED THAT THESE ISSUES HAD BEEN ADDRESSED MORE EFFECTIVELY EARLIER. HOWEVER, WE ARE PLEASED NOW TO SEE DEMONSTRATIONS OF SIGNIFICANT CHANGE IN SEVERAL ASPECTS OF NORTHROP OPERATIONS AND A COMMITMENT TO RESOLVE THOSE PROBLEMS WHICH HAD NOT YET BEEN ADDRESSED.

SINCE OCTOBER 1987, NEARLY 60% OF NORTHROP'S TOP EXECUTIVES HAVE LEFT THE COMPANY. WE BELIEVE THIS CHANGE, ON NET, HAS BEEN NECESSARY AND HEALTHY FOR NORTHROP PERFORMANCE. THE NEW CORPORATE LEADERSHIP IS EXERTING STRONGER OVERALL DIRECTION AND CONTROL. EXCESS ASSETS HAVE BEEN SOLD AND RESOURCE CENTERS OF EXCELLENCE, SUCH AS COMPUTER AND PAYROLL CENTERS, ARE BEING ESTABLISHED TO REDUCE OVERHEAD.

I DO NOT MENTION THESE MATTERS TO DEFEND THE COMPANY, BUT TO ADD BALANCE TO THE UNDERSTANDING OF THE REVIEW'S FINDINGS. THE REVIEWERS DID NOT SEE STERLING EXAMPLES OF MANAGEMENT PERFORMANCE IN CONTACTS WITH NORTHROP. HOWEVER, THEY DID SEE SOME VERY POSITIVE STEPS IN THE RIGHT DIRECTION. WHERE THEY FOCUSED ON THE NEED FOR FURTHER IMPROVEMENT, NORTHROP HAS BEEN FULLY COOPERATIVE.

UPON COMPLETION, THE REVIEW WAS BRIEFED TO MR WELCH AND OTHER KEY AIR FORCE MANAGERS IN MID-JULY. IT WAS BRIEFED TO MR KRESA ON JULY 24TH WITH MR WELCH PRESENT. SINCE THEN, MR WELCH HAS HAD DETAILED DISCUSSIONS WITH MR KRESA ABOUT NORTHROP'S MANAGEMENT ACTIONS TO ENSURE FULL IMPLEMENTATION OF ONGOING IMPROVEMENTS AND DEVELOP PLANS FOR FURTHER IMPROVEMENTS. THIS PROCESS IS FAR FROM OVER AND MR WELCH EXPECTS TO REMAIN ENGAGED WITH NORTHROP MANAGEMENT ON THESE PROBLEMS ON A CONTINUING BASIS.

THE REVIEW WAS ALSO PRESENTED TO THE STAFF OF THE SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS OF THE HOUSE COMMITTEE ON ENERGY AND COMMERCE. THIS WAS DONE AT THE REQUEST OF CHAIRMAN DINGELL ON SEPTEMBER 21ST. ON THE 9TH OF OCTOBER, THE REVIEW WAS THE SUBJECT OF AN OPEN HEARING CONDUCTED BY THAT SUBCOMMITTEE. THE AIR FORCE WAS CONCERNED, AND REMAINS CONCERNED, THAT DETAILED PUBLIC DISCUSSION OF THE REVIEW'S FINDINGS IN THE FORUM OF A HEARING CAN NOT PROVIDE THE PROPER CONTEXT AND A BALANCED UNDERSTANDING OF THE REVIEW. WE BELIEVE THAT THIS REVIEW IS A GOOD EXAMPLE OF THE KIND OF GOVERNMENT OVERSIGHT AND IMPROVEMENT EFFORTS THAT THE CONGRESS AND THE PUBLIC WOULD APPROVE AND SUPPORT. WE ALSO BELIEVE THAT SUCH REVIEWS ARE MORE PRODUCTIVE AND EFFECTIVE IF THEY CAN BE ACCORDED SOME DEGREE OF CONFIDENTIALITY. WE ARE CONCERNED THAT THE PUBLIC DISCUSSION AND RESULTANT OUT-OF-CONTEXT PUBLICITY MAY IMPEDE FUTURE EFFORTS WITH NORTHROP AND OTHER CONTRACTORS TO CONDUCT SIMILAR REVIEWS.

I WILL NOW TURN TO THE B-2 PROGRAM. FIRST, I'D LIKE TO RELATE THE REVIEW TO THE B-2 DIVISION. IN MANY WAYS, THE NORTHROP B-2 DIVISION HAS BEEN LEADING THE WAY IN IMPROVED OPERATIONS. AN EXPERIENCED SENIOR EXECUTIVE WAS HIRED FROM OUTSIDE THE CORPORATION TO HEAD THIS DIVISION. THE B-2 DIVISION HAS AN APPROVED SYSTEMS ENGINEERING MASTER PLAN; WEEKLY MEETINGS ARE HELD BETWEEN ENGINEERING AND MANUFACTURING DEPARTMENTS TO WORK TRANSITION TO PRODUCTION ISSUES; SYSTEMS ENGINEERING TRAINING HAS BEEN CONDUCTED; THE DIVISION GENERAL MANAGER HAS BEEN PERSONALLY WORKING TO IMPROVE SUBCONTRACTOR ISSUES; AND, THAT DIVISION HAS, AT TIMES, USED THE RESOURCES OF OTHER NORTHROP DIVISIONS TO GET PAST TEMPORARY PROBLEMS IN THE PROGRAM. SO, PROGRESS IS BEING MADE AND THE COMPANY IS SHOWING ITS COMMITMENT TO THE B-2 PROGRAM'S SUCCESS.

IN TERMS OF WEAPON SYSTEMS PROCUREMENT, THE B-2 SHOULD SERVE

AS AN EXAMPLE OF HOW THE NEXT GENERATION OF ADVANCED AIRCRAFT MUST BE PRODUCED. THIS IS NOT TO SAY THAT THE DEVELOPMENT OF THE B-2 HAS NOT HAD ITS SHARE OF PROBLEMS, BUT RATHER THAT THE ACQUISITION APPROACH HAS BEEN STRUCTURED TO IDENTIFY POTENTIAL PROBLEMS EARLY TO REDUCE THE RISK. THERE ARE THREE SPECIFIC AREAS WHERE THIS ACQUISITION APPROACH IS BEST EXEMPLIFIED--RISK REDUCTION, LABORATORY TESTING, AND PRODUCIBILITY.

SINCE EARLY 1980, THERE HAS BEEN AN AGGRESSIVE EFFORT TO MINIMIZE RISKS ASSOCIATED WITH THE TECHNOLOGIES THAT ARE IMPORTANT TO THE B-2, YET ARE NOT QUITE MATURE. THE RISK REDUCTION EFFORT IS EMBODIED IN OVER ONE-HALF MILLION TEST HOURS. EARLY EFFORTS IN THE MANUFACTURING OF LARGER SCALE COMPOSITES AND THE TOOLS NECESSARY TO MASS PRODUCE THESE SECTIONS HAVE GREATLY REDUCED TOUCH LABOR, THEREBY MINIMIZING DEFECTS. ADVANCES IN THE CONSTRUCTION OF LOW OBSERVABLE MATERIALS HAVE REDUCED MANUFACTURING COSTS.

AS THE AIRCRAFT DESIGN TOOK SHAPE, EVERY MAJOR COMPONENT OR SUBSYSTEM WAS EXTENSIVELY TESTED IN A LABORATORY ENVIRONMENT. NINE SEPARATE LABORATORIES WERE UTILIZED, SUCH AS THE FLIGHT CONTROL AND HYDRAULIC INTEGRATION LABORATORY. THIS LABORATORY CONSISTED OF THE ENTIRE FLIGHT CONTROL SYSTEM TO INCLUDE HYDRAULIC LINES, FLIGHT CONTROL SURFACE ACTUATORS, COMPUTERS, AND PUMPS. THIS EXACT GROUND SIMULATOR OF THE FLIGHT CONTROL SYSTEM WAS USED EXTENSIVELY TO DEVELOP THE FLIGHT CONTROL SOFTWARE PRIOR TO INSTALLATION ON THE AIRCRAFT. BECAUSE THE B-2's PERFORMANCE IS SO DEPENDENT UPON THE RADAR AND NAVIGATION SYSTEMS, A FLYING TEST BED, A KC-135, IS UTILIZED IN THE DEVELOPMENT OF THESE TWO SYSTEMS. FINALLY, EXTENSIVE SUBSCALE AIRCRAFT AND FULL SCALE COMPONENTS HAVE BEEN TESTED ON INDOOR/OUTDOOR RADAR RANGES. OVER 30,000 HOURS OF RADAR CROSS SECTION TESTING HAS GREATLY ENHANCED THE UNDERSTANDING OF THE AIRCRAFT'S SIGNATURE.

THE EXTENSIVE RISK REDUCTION EFFORTS HAVE NOT ONLY BENEFITED THE BASIC AIRCRAFT ENGINEERING, BUT HAVE ALSO ENHANCED THE MANUFACTURING OF THE B-2. THE B-2 REPRESENTS THE FIRST TOTAL PRACTICAL APPLICATION OF A VARIETY OF ADVANCES IN MANUFACTURING TECHNOLOGIES. IT HAS PIONEERED THE TOTAL INTEGRATION OF COMPUTER AIDED DESIGN, ENGINEERING, MANUFACTURING, LOGISTICS SUPPORT, BUSINESS INTEGRATION, AND PRODUCT DATA EXCHANGE TECHNOLOGIES. SENSOR-EQUIPPED ADAPTIVE TOOLS, SUCH AS DRILLS, WHICH WERE PREVIOUSLY UNAVAILABLE BUT ARE CRITICAL WHEN WORKING WITH MULTILAYERED COMPOSITES, WERE DEVELOPED FROM WITHIN THE B-2 PROGRAM. A COMPUTER AIDED DESIGN/COMPUTER AIDED MANUFACTURING SYSTEM LINKED TO THE MAJOR MANUFACTURING CENTERS GREATLY REDUCED THE NEED FOR MOCKUPS AND PROTOTYPING. THE INTRODUCTION OF MANY AUTOMATED TOOLS FOR HIGH SPEED PRODUCTION SUBSTANTIALLY REDUCED TIMES REQUIRED FOR MANUFACTURING OPERATIONS.

THE SUCCESS OF TEN YEARS OF RISK REDUCTION, LAB TESTING, AND MANUFACTURING TECHNOLOGY ENHANCEMENTS IS BEST HIGHLIGHTED BY THE EARLY FLIGHT TEST RESULTS. THE ACCOMPLISHMENTS TO DATE ON THE B-2 FLIGHT TEST PROGRAM ARE BEST SUMMARIZED FROM THE RECENT DEFENSE SCIENCE BOARD REVIEW:

"... FROM THE RESULTS OF BLOCK 1 TESTING THAT WE HAVE SEEN, WE NOTE NO TECHNICAL OR PERFORMANCE PROBLEMS THAT WOULD LEAD US TO CHALLENGE RANGE AND PAYLOAD PERFORMANCE EXPECTATIONS FOR THE B-2. NOR HAVE WE OBSERVED ANY FLIGHT WORTHINESS OR AERODYNAMIC PROBLEMS THAT GIVE US CAUSE FOR PROGRAM CAUTION."

THIS VIEW IS SHARED BY DR ROBERT DUNCAN, DIRECTOR, OPERATIONAL TEST AND EVALUATION, OFFICE OF THE SECRETARY OF DEFENSE:

"FROM THE DATA WE HAVE ASSESSED, THERE DOES NOT APPEAR TO BE ANY SIGNIFICANT AERODYNAMIC OR AIRWORTHINESS HURDLES TO OVERCOME THAT WOULD CONFLICT WITH THE OPERATIONAL EXPECTATIONS OF THE B-2"

"THE ENGINES AND ASSOCIATED SYSTEMS HAVE PERFORMED EXTREMELY WELL"

"THE EASE OF PERFORMING B-2 AIR REFUELING IS A TESTIMONY TO ITS EXCELLENT FLYING QUALITIES."

IN SUMMARY, WE ARE WELL ALONG IN A STRUCTURED, ORDERLY DEVELOPMENT PROCESS USING INNOVATIVE DESIGN AND ADVANCED PRODUCTION METHODS. THE AIRCRAFT IS MEETING PROGRAM REQUIREMENTS AND HAS FARED WELL IN INDEPENDENT REVIEWS.

AT THE BEGINNING OF MY STATEMENT, I CITED THE IMPORTANCE OF CONSIDERING THE AIR FORCE REVIEW OF NORTHROP CORPORATION WITHIN THE APPROPRIATE CONTEXT. I HOPE THAT MY TESTIMONY HERE TODAY WILL HELP TO PROVIDE THE COMMITTEE WITH A BALANCED VIEW. THE AIR FORCE WILL STAY ENGAGED WITH NORTHROP AT THE SERVICE ACQUISITION EXECUTIVE LEVEL, THROUGH OUR PROGRAM DIRECTORS AND PROGRAM EXECUTIVE OFFICERS, AND THROUGH THE DEFENSE PLANT REPRESENTATIVE OFFICES TO ENSURE CONTINUOUS IMPROVEMENT. I ALSO CONTINUE TO CALL ATTENTION TO THE FACT THAT PROGRAMS THAT OFFER STEP IMPROVEMENTS IN OUR MILITARY CAPABILITIES WILL HAVE RISKS THROUGHOUT THEIR LIFETIMES. IT IS OUR JOB TO MANAGE THESE RISKS BY THE PRUDENT BALANCE OF PERFORMANCE, COST, AND SCHEDULE. WE WILL CONTINUE TO GIVE THIS COMMITTEE AND ALL OF THE INVOLVED MEMBERS OF CONGRESS AND THEIR STAFFS CURRENT ACTUALS AND CURRENT FORECASTS ON EACH PARAMETER OF PROGRAM MEASUREMENT.

I ALSO SAID THAT THE REVIEW IS NOT, AND SHOULD NOT BE USED AS, A BASIS FOR PROGRAMMATIC OR FUNDING DECISIONS ON THE B-2 OR OTHER PROGRAMS. I HAVE SUMMARIZED SOME OF THE STRONG POINTS OF THE B-2 PROGRAM AND QUOTED SOME INDEPENDENT VIEWS THAT SUPPORT ITS OUTSTANDING TECHNICAL PROGRESS IN DEVELOPMENT AND TESTING. I

STRONGLY URGE THIS COMMITTEE AND ALL MEMBERS OF THE SENATE AND HOUSE OF REPRESENTATIVES TO SUPPORT CONTINUED AUTHORIZATION AND APPROPRIATION OF THE B-2 PROGRAM, WHICH WILL PROVIDE VITAL DETERRENT AND WAR-FIGHTING CAPABILITIES FOR MANY YEARS TO COME.

THANK YOU. I WILL BE PLEASED TO ANSWER THE COMMITTEE'S QUESTIONS.

STATEMENT OF

BRIGADIER GENERAL DREWES

DEPUTY CHIEF OF STAFF/CONTRACTING
AIR FORCE SYSTEMS COMMAND

Mr. Chairman and members of the Subcommittee, I appear today at your invitation to discuss a recent Air Force review of the Northrop Corporation.

In May 1990, I was asked to conduct a review of the Northrop Corporation's performance on Air Force programs. I was instructed to identify Northrop common performance problems, determine root causes for those problems, assess Northrop's corrective actions to date at the corporate level, and suggest lessons learned from these experiences.

I understood that Mr. John J. Welch, Jr., Assistant Secretary of the Air Force (Acquisition) wanted this information for his use in continuing discussions with the Northrop CEO. I believe Mr. Welch wanted a framework for these dialogs to bring focus on the key problems needing corporate-level attention to improve processes.

I established a six-step approach to this task with the assistance of a small team of functional experts. First, we

reviewed a variety of status reports submitted in recent years by program directors and plant representatives. In addition, we interviewed the program directors, plant representatives and their staffs to further understand their concerns. Second, from these observations we found general problem areas which were common to two or more of the programs we reviewed. Third, we visited Northrop Corporate Headquarters. There we reviewed corporate records and interviewed corporate staff. In addition, we met with key staff from four of their divisions. Fourth, from the visit with Northrop we identified root causes for the common problems. Fifth, from the visit we also assessed what Northrop was doing to correct the problems and their root causes. Finally, we suggested a number of lessons learned from this study.

The scope of the review only included certain Air Force programs. Further because the review looked across the Corporation, I was not attempting to draw conclusions about any particular Northrop program and I am not the appropriate official to assess these programs. The review did not include Northrop's Precision Products Division. Furthermore, we did not examine Northrop's performance on the Advanced Tactical Fighter program to preclude any impact on the source selection.

We confirmed the existence of problems in six areas: systems engineering, transition to production, software management, subcontractor management, organization/personnel and business systems.

We found that the Northrop Corporation had initiated corrective actions in recent months in many areas of concern to the Air Force. We also found other areas for which no corrective action had started. We were particularly concerned that corporate action was needed in transitioning programs from the design

phase into production and in the management of subcontractors.

Although we concluded that it was not business as usual at the Northrop Corporation, strong follow through is needed to make the positive changes endure and to institute change in the areas which they had not yet addressed. Schedules and metrics for measuring progress were needed.

While I wish to be responsive to any questions the members may have about the review we conducted, the Air Force requests that the remainder of this hearing be closed to the public. This request to close the hearing is made for two reasons.

First, through the course of the review, I and members of my team had access to commercial or financial information which would be considered confidential or proprietary to Northrop. It is often difficult, if not impossible, to segregate from the conclusions we made and the findings we reached, the underlying information which is proprietary to Northrop. To disclose that underlying information to the public could likely cause substantial harm to Northrop's ability to compete for new business. Indeed, the law does prohibit public disclosure of this type of information.

Second, some of the information obtained from Northrop during the course of this review was provided by Northrop with the expectation that the information would not be made available to its competitors. Northrop freely and willingly provided information to members of the review team. Certainly, the government is entitled to full disclosure of costs and business information when pricing new procurements, but the level of detail and cooperation provided by Northrop for this type of review will no longer be available from Northrop, or other contractors, if they cannot expect the government, in the future, to protect that

information from competitors.

We believe it is necessary that the remainder of the hearing be closed to prevent the disclosure of information that could cause competitive harm to Northrop and so as not to impair the government's ability to seek this type of information, and conduct these kinds of reviews, in the future.

Mr. Chairman, that completes my statement.

Senator EXON. Mr. Secretary, thank you very much. Thank you for coming up here this morning. We appreciate it very much.

Without objection, I would like to ask that my opening statement be inserted in the record at the beginning of the hearing this morning. Let me get right to the questioning, maybe starting out with a statement or two to try to clarify where this Senator comes from and I think from where many of the Senators are coming.

We thank you not only for being here this morning, but we also appreciate the letter from the Commander in Chief this morning to try to put this issue in proper perspective. I do not believe that the whole B-2 program has been placed in proper perspective.

In these critical times of cutting the budget which must be cut, we are working very hard in this committee to see that this is done in a fashion that is well thought out, well designed, and not taking the machete to the programs and slashing everything across the board. We are making some hard choices, and we are willing to make those hard choices. I think it is critically important that maybe we try to set out this morning once and for all the true facts with regard to the B-2.

In the first instance, I could care less about Northrop or any other defense contractor. They are only an instrument, as I see it, to the projection of the national security forces of the United States as we look into the future.

I listened very carefully to your words this morning with regard to what you believe are improvements made in the Northrop organization. We all know it has been woefully lacking, but the failure or honesty of the Northrop organization is not what is on trial here.

What we are trying to focus on, as I understand it, is whether or not we should proceed with the B-2 program after investing $27 billion plus in this system—I call it a system because all too often it is just dismissed as another airplane. It is far more than that—we have yet to see the B-2 jump through the hoops, the proving tests that this committee has set forth, and we have not committed to buy 75 of these aircraft, as everyone erroneously assumes. We are going to buy no more of these aircraft than we have to buy until it is proven up, until we have a chance to get that system to prove up.

This is not just another aircraft, in the opinion of this Senator. If this system is successful as we hope it will be—and we think and hope that the test will prove it up to be worthy—then I would suggest that this is probably the most quantum leap forward in the national security interest and deterrent of the United States than for any other system that we have ever developed. That is how important I think it is. I appreciate the fact that the Commander in Chief has lent his shoulder to the wheel as of this morning once again.

The B–2 program is in big trouble. I think the B–2 program had better be put back into perspective. What is it all about? The B–2 program is not just another aircraft. The B–2 program is far more important than the management or lack thereof at the Northrop Corporation. I am delighted to see that you are on top of that. It is an investment in the future security interest of the United States.

The B–2 program has already been killed in one House of the Congress and may well be killed this afternoon, Mr. Secretary, in the Appropriations Subcommittee on Defense. They are having a meeting this afternoon, and we are not sure the votes are there to even continue the minimum program that we have outlined.

What is that minimum program? That minimum program buys only two more of these aircraft to keep the line open at a very critical stage.

Let me ask you this question to see if you agree with my view and the view of many of my colleagues. If for whatever reason the B–2 does not become a workable part of the air-breathing leg of our triad, then I believe, and we have received testimony time and time again from our top military people, that certainly by the year 2000 and maybe sooner that important third air-breathing leg of the triad, the deterrent triad that has served us so very well, is going to start to deteriorate very rapidly.

Why? Because the heart and soul of our third leg of that triad today is the B–52, and the youngest one is something like 27 years old. True, we have 97 of the B–1 aircraft, but the B–52 is the heart and soul of that leg of the triad today.

I believe that if those in Congress and outside of Congress and all the newspaper experts believe that we are heading for a diad as opposed to a triad, then I would say that is a legitimate consideration and argument. I do not happen to agree with it because the triad has served us so well.

I suppose a case could be made that giving the reduced threat we could get by with a diad rather than a triad. I suggest that that road should not be followed and that we should have a balanced triad if we are going to have the deterrent that I think is necessary.

In your opinion, Mr. Secretary, if the B–2 fails, whether it does not perform up to standards in the test or whether it is canceled by the Congress, what do you think that would spell for the chances of the air-breathing leg of the triad in the 21st century?

Secretary RICE. Well, Mr. Chairman, I certainly share your view that if the B–2 fails we will see an atrophy of the air-breathing leg of the triad. I would consider that a great tragedy from the point of view of the security of the country and from the point of view of our nuclear deterrent. That is without even speaking to the other

aspects of the B–2 that I think are also incredibly important; namely, the fact that it offers us deterrence across the whole spectrum of conflict. It offers us very significant capabilities in the conventional setting as well as in that nuclear setting.

Returning to the nuclear mission, the air-breathing leg, as the President points out in his letter, is the most stabilizing element of our nuclear triad of the overall strategic balance. Your point about the way the triad has served us well for so many years is very well taken, and we want to continue to keep all three legs robust.

If we were to move to a less strong set of insurance, if one wanted to think of it that way, we also have to remember that the whole thrust of our arms control efforts and our thinking about stability in the strategic balance has been focused on a concern about the fast flyers, not the slow flyers.

If we are to change or modify the structure of our strategic triad, one would certainly expect that, as in fact is the case in START, the focus will be on the fast flyers, on the strategic missiles. That is where we are most concerned about the Soviet threat, the SS–18s and their other ICBMs and strategic missiles. That has been the focus for reduction in the START effort. Both Presidents have already indicated that in START II, as a follow-on to this treaty which is intended to begin just as soon as this one is completed, the focus will again be very clearly on the ICBM side of things for further reductions.

So if we were to walk away from the B–2, not only would we be passing up this monumental technological accomplishment and gain in capabilities to which you have correctly alluded, but in my view we would be going down exactly the wrong road from an arms control and a strategic stability point of view.

Senator EXON. Mr. Secretary, my time is up. I have one last question to which I think you can give us a quick answer.

If the House position essentially canceling out the B–2 program were to prevail, I suspect that you feel that would do great harm to the START Treaty that we are now working on.

What would be your recommendation to the Secretary and to the President with regard to the present START Treaty if the B–2 were canceled?

Secretary RICE. Mr. Chairman, if the B–2 were canceled we would have to reassess all the planning that is going on on the strategic force structure under the START Treaty, the reductions that are planned to be taken, heavily in the ICBM force, more moderately in the bomber force, the balance that can be achieved there under the counting rules, the ability to cover targets, all of those things would be affected by the loss of the B–2. It would upset the whole basis for our strategic force planning.

Senator EXON. And at a minimum cause serious delay.

Secretary RICE. Absolutely, sir, it would cause a reassessment and, I believe, a delay in the ability to proceed with the treaty.

Senator EXON. Thank you, Mr. Secretary. Senator Warner.

Senator WARNER. Thank you, Mr. Chairman.

You were not here when we started the hearings this morning, but I wanted very much to acknowledge the hard work that you have done on this program. As a matter of fact, you have been in almost daily contact with the Secretary of Defense or the Secretary

of the Air Force. It is my understanding that you have been working with the National Security Advisor.

As you and I and Chairman Nunn and others try and pilot a course through this conference period with the House, I am optimistic that we can resolve the difference between the House and the Senate, which is a major one, in a manner to keep this program operative.

In that light, Mr. Secretary, while I have you here and we are working on it, there has been some discussion on the funding level in the out years for the B–2 program. I would not want to see us fall into the problem we had with the B–1 where we put a fixed cap on dollar and a fixed number of aircraft. Then those two fixed posts began to grind each other through the years.

We want to avoid that should we have to approach it. We want to avoid that as an option to settle this. Would you not share that view?

Secretary RICE. Yes, sir, I certainly would.

Senator WARNER. Mr. Secretary, reading through this testimony of yours today, coupled with the report itself, having once been in your position as Secretary of the Navy and conducting several investigations similar to this, the key thing is the attitude of the company and how forthcoming they are in response to your inquiries.

I judge from your testimony that Northrop was very forthcoming, that they opened up their books and that there was no area in which they tried to pull back any information or conceal facts that would have made it more difficult for you to prepare this report. Am I correct?

Secretary RICE. Senator Warner, Northrop was completely cooperative. And the new chief executive officer of the corporation has stepped up to all of the recommendations and findings in the report. And, in fact, had already begun work on making changes and improvements in a number of the areas that the report reviewed.

Senator WARNER. Now the aircraft is about to undergo a series of tests to determine its low-observable characteristics. The Congress last year in its bill, in many of the provisions drafted by the chairman here, decided that we would have to go through these various milestones. Even though we have not approached them, all indications are that this aircraft is going to measure up to the expectations, are they not?

Secretary RICE. Every indication we have at this point is that that is correct. Yes, sir. But the proof will be in the pudding. It is due to fly fairly soon. We hope to get that done yet this year, the start of that low-observable testing, which is what the particular gate was tied to.

Senator WARNER. This is probably one of the most complex programs ever undertaken by the Department of Defense. You have worked very hard and I wish to commend you in the period with which you have had the trusteeship for this on behalf of the public.

But my understanding is that this program today is only 1 day behind schedule. That, to me, is a very dramatic situation. Am I correct in that?

Secretary RICE. Senator, I really cannot give you an answer on that.

Senator WARNER. Well, I got it from your air staff, so let us stick with it. It sounds good.

Secretary RICE. It certainly does. I hope it is doing that well.

Senator WARNER. You have no basis to disagree with me on that?

Secretary RICE. I have no basis to disagree with you. The program is really coming along very well in all of its dimensions. We have seen a great deal of improvement there since Mr. Boileaux was brought in from outside to take over the program. I would observe that the company, as is indicated by the review, needs to continue to improve its internal management so as to do better and better over time at its actual performance against its contract obligations. We are going to stay right on top of that.

Senator WARNER. It seems to me the operative paragraph which should, in my judgment, set the tenor for this hearing is on page 2 when you said, "I believe that a fair consideration of all the available technical and programmatic information on the B–2 leads to the conclusion that if authorized and funded by the Congress, the B–2 program will continue to be executed in a credible manner and result in a vital capability in our strategic and conventional war fighting process."

Secretary RICE. Yes, sir, I believe that is right.

Senator WARNER. I hope that is the final conclusion of the Congress, also.

Thank you, Mr. Secretary. Thank you, Mr. Chairman.

Senator EXON. Thank you very much, Senator Warner. Thank you for your kind comments. I apologize for being 10 minutes late.

If you think we have a mess on the budget around here, look at the traffic in Washington, DC this morning. A 25-minute journey turned into 1½ hours. Senator Thurmond.

Senator THURMOND. Thank you, Mr. Chairman.

Secretary Rice, would you put the Northrop problem into the proper perspective for us? In other words, in your judgment are the problems the Air Force found in Northrop unique or would you find similar problems in other large corporations?

Secretary RICE. Senator Thurmond, I believe that the problems at Northrop are not unique. I do think, though, we should be clear and candid enough to say that the problems there have been worse than they should have been. But corrective actions now seem to be underway, have been underway in many cases for a year or more, and I think the current assessment is one that allows us to have confidence for the future. But there is a ways to go yet. Other companies share these same kinds of problems.

Senator THURMOND. Are you now satisfied with the situation?

Secretary RICE. Sir, I am satisfied that the Northrop management and the Air Force management are on top of the problems. And with a continuation of the kind of cooperation and effort and attention we have seen from the Northrop management and our continued oversight, that these problems will be resolved and their capabilities increased across the full range of areas that we reviewed.

Senator THURMOND. The Air Force will give continuous supervision to this matter to see that the company does operate properly?

Secretary RICE. Yes, sir.

Senator THURMOND. Did General Drewes study the management system in Northrop thoroughly? How about at the B–2 division in particular?

Secretary RICE. He did not focus his review, Senator Thurmond, on any particular program. He looked at crosscutting management issues and systems across the corporation. I think it was a thorough review based on the charter that he had, which I described in my statement. And I am quite comfortable with the results of that review.

I would note that Mr. Kresa, the CEO of Northrop, has expressed his satisfaction with the results of the review as well and showed his cooperation and commitment to move to work on them.

I might point out that Mr. Kresa had somewhat earlier, in fact back in October 1988, when he was president, I believe, but not the CEO of the corporation, he initiated an outside review conducted by the Arthur D. Little Corporation. They gave Northrop what would at best be called modest grades at that point. And they came back again this summer and reassessed the same set of things that they had looked at—this was an independent study done for the Northrop management—and that Arthur D. Little management review also showed considerable improvement in many areas when they came back this summer compared to what they had looked at in 1988.

So it has not just been the Air Force efforts. The Northrop management has been making its own efforts, both directly and by bringing in outside experts, to help improve their situation.

Senator THURMOND. Yesterday's Post article said that Northrop cannot account for the cost of many of its programs. Is this true?

Secretary RICE. That statement is not a conclusion of the management report that it was attributed to. No, sir.

Senator THURMOND. Secretary Rice, despite my sticker shock, I support the B–2 program. I know that the aircraft works. I believe in its capability. However, I am now concerned whether or not Northrop is capable of going into full production of the B–2.

What and how long will it take for Northrop to correct the problems that you have identified in your probe?

Secretary RICE. Senator Thurmond, the review, as I suggested in my statement, shows that many of the improvements have been taken first in the B–2 division. In particular under the new program manager's leadership there has been a great deal of focus in the B–2 division on the very problems of the transition from development into production.

Our current assessment is that they are getting on top of that problem. I believe they will be ready to take on a higher rate of production when we are far enough along in the testing and the Congress approves such a rate, which now will not be earlier than the fiscal year 1992 funding. And the actual time at which Northrop would have to execute that funding would come 1 year to 3 years beyond that yet.

I think there is time and the curve is such that we can expect they will be in position when that funding is provided.

Senator THURMOND. Secretary Rice, if the press accounts are correct, there are currently seven grand jury and 11 criminal probes

into allegations against Northrop. What triggered the Air Force probe? And what did you hope to gain from it?

Secretary RICE. The Air Force review was entirely separate from those investigations which are the newspaper reports you are alluding to. Ours was based on a recognition that certain kinds of management problems had shown up within Northrop on several different programs.

Jack Welch made the judgment that it would be helpful to have a crosscutting review that would try to not only identify where the problems were and which management processes and systems, but would try to get beyond that into aspects of corporate culture and other ways of operating to try to understand the root causes and help both parties deal with them.

So that was the motivation for that review. That is what it was focused on. It has been very helpful to both the Air Force and Northrop top management in confronting and making improvements in management processes within the Northrop Corporation.

Senator THURMOND. I believe my time is up, Mr. Chairman.

Senator EXON. Thank you very much, Senator Thurmond. Thank you for your questions. I just want to say what a pleasure it has been to work with you over the years on many knotty problems. You do an excellent job as the ranking member on the Strategic Subcommittee, and we always appreciate your input and advice. Thank you. Senator Levin.

Senator LEVIN. Thank you, Mr. Chairman, and welcome, Mr. Secretary. The news reports indicate that there has been a written report. Is there a written report of these findings?

Secretary RICE. No, sir. There is a briefing, a set of briefing charts which are considered proprietary, and in that sense confidential or sensitive. There is a statement in addition to mine which gives a brief summary of the material that I have also offered in the record here this morning that General Drewes gave to the subcommittee, and of course we would not have any problem whatever with providing any member of the committee who is interested that briefing directly, if you would like to have it, but we do think it ought to be kept corporate proprietary and competition sensitive.

Senator LEVIN. Why is there no report of this investigation in writing?

Secretary RICE. Well, sir, it was intended to be a part of an on-going process to work with the Northrop management in the improvement of conditions that the Air Force saw there. It was not thought of as a kind of Inspector General review, or something of that sort. It was part of an on-going process of working with the Northrop Corporation on management issues that our acquisition executive saw as cutting across a number of program areas. It was part of a much larger fabric of such activities.

Senator LEVIN. If there was not a formal report, how were the findings of the investigation relayed through the channels in the Air Force?

Secretary RICE. They were briefed to Mr. Welch and some of his key people, and when he was satisfied with that, they were then briefed, in Mr. Welch's presence, to Mr. Kresa, who is the CEO of Northrop.

Senator LEVIN. You are saying that you have made that briefing available to this committee?

Secretary RICE. No, sir. I am saying we would be happy to do so. We did make the briefing—at Congressman Dingell's request, when they learned about its existence we did provide the briefing to the staff of the Subcommittee on Investigations and Oversight that Mr. Dingell chairs, and it was that subcommittee that held the hearing the other day and put out the statement on which the newspaper article was based.

Senator LEVIN. Have you been asked for a copy of that briefing by any member of this committee or our staff?

Secretary RICE. Not to my knowledge.

Senator LEVIN. Okay. Well, I would like to see it.

Secretary RICE. We would be happy to provide it to you.

Senator LEVIN. Would you say that overall the results of that investigation are favorable to Northrop?

Secretary RICE. I tried to say in my statement, Senator, that I do not consider it—it has been characterized as devastating, characterized as a good news story by others. I do not think either of those characterizations is apt, or accurate. I think it falls somewhere in between.

It shows a corporation with a lot of the growing pains associated with having gone from a small business base to a much larger one, still struggling with a lot of those problems. I think there is reason for us to be unhappy that some of those problems are not dealt with sooner and earlier, but at the same time, it showed quite a lot of activity and attention to them, especially in recent times since the new CEO has taken over and since the new manager of the B–2 division has been in place and certainly, as I have also expressed, they have cooperated fully with us and the new CEO has stepped up to all of the areas that the review uncovered that he had not already started reforms in.

Senator LEVIN. The chairman of Northrop is quoted as saying that it was a very favorable report, so from your testimony this morning, you would not agree with his assessment of that report?

Secretary RICE. I would call it a fair and balanced report that identified progress that had been made in a number of areas but also identified places where further improvement was needed and, as I have said, the chairman, the CEO in particular, has certainly stepped up to all of those areas.

Senator LEVIN. But is it fair to say you did not agree with the Northrop chairman that it is a very favorable report?

Secretary RICE. I would not characterize it as a very favorable report.

Senator LEVIN. Would you characterize it as a favorable report? I heard your characterization. In your opinion, is it a favorable report, getting right down to it.

Secretary RICE. If I had to net it all out, I would say that if you kind of added it up, piece by piece, it showed more areas where effort had already been taken and progress was being made than it showed areas needing improvement, where that was not the case. So if you kind of kept a scorecard, I suppose you could say the positive side of the ledger outweighed the negative side, but I do not find that a very useful assessment. I think it was balanced. It

showed progress. It also showed the need for further improvement, and I think it is important to note that the corporation has agreed with those findings and stepped up to those areas for further improvement.

Senator LEVIN. By the way, when I asked you if you would make available the briefing to members of this committee, I also included our staffs.

Secretary RICE. Yes, sir.

[The information follows:]

On October 11, 1990 the Secretary of the Air Force was asked to provide this information to the committee by October 26 to meet printing schedules. Two extensions on this deadline were granted. Despite the two extensions, the Air Force failed to provide the requested information, and there was no indication when the material would be provided. On November 13 the committee proceeded to print this transcript. When provided, the answer to this question will be retained in the committee's files.

Senator LEVIN. The last question is whether or not—my time is up.

Senator EXON. Senator Levin, thank you very much. Senator McCain.

Senator MCCAIN. Thank you, Mr. Chairman. Welcome, Secretary Rice. I continue to be impressed at the very fine job you are doing as Secretary of the Air Force, and we appreciate your very forthcoming testimony here today.

Before I get into specific questions, Secretary Rice, let us talk for a minute about the fact of whether—and perhaps you have plowed this ground too many times—we really need a B–2?

One of the previous questioners talked about, somehow the criticality of a triad, that this has been in place for all these years so therefore it must always be there. Do you not think that the ending of the Cold War, which at least in this Senator's belief is the case, and that of most of the American people, indicates that we should reevaluate as to whether we need a triad or not, particularly whether we need an aircraft that per copy will be the most expensive in the history of this Nation, using any benchmark that you choose to use?

It seems to me that part of this debate over the B–2 should not be just the cost and continuing technical problems, which I hope I have time to get into at least a couple of, but what is the rationale for an airplane which is going to carry out a nuclear strike on a nation which, frankly, is in disarray, and, some believe, in danger of dissolution?

Secretary RICE. Senator McCain, I would emphasize that the mission of the B–2 is deterrence. Nuclear deterrence is its primary mission. It offers great capability and flexibility across the whole spectrum of conflict. It is a monumental technological achievement to combine stealth in a high payload range aircraft, which means any place, any circumstance in the world, is within reach of U.S. power on very short notice, and there is no other kind of system that really provides us that except the ICBM or the ballistic missile, sea-launched or ground-launched, and those, of course, are dedicated entirely to the nuclear mission.

Now, let us talk about cost a minute, if we can, since you raised it.

Senator MCCAIN. Can we just talk about the mission a second? For example, tell me the role that the B–2 could play in the Middle East scenario in case of conflict with Iraq.

Secretary RICE. I am not going to get at all deeply into operational aspects over there, but we have the B–52s deployed so that they are available for that eventuality.

Senator MCCAIN. Because of the conventional capability, right?

Secretary RICE. Conventional capability, absolutely. They were the only system that held Iraq at risk from Day 1, should that have been necessary, if they would have moved on south from the very beginning of that exercise. The B–52s, as you know, are old and much more vulnerable to modern air defenses. The B–2 is what gives us the quantum leap past modern air defenses.

It is hardly credible, in my view, Senator McCain, for us to be claiming that we need stealth in small vehicles, short-legged vehicles—shorter legged vehicles—but that we do not need it in the high payload range aircraft. I just do not see that that holds water.

The mission is there, it is clear, within the strategic nuclear mission—and by the way, the Soviets are modernizing every element of their strategic nuclear forces that they are allowed to keep under START. They have kept that going right along, so that threat, that capability, is there, and I am sure you would agree we need to deter capabilities, not intentions.

As long as that capability is there, our deterrence is going to be required, and within the examination of our triad, the B–2 should be the last place we look for modifications or reductions. The whole focus of arms control and thinking about strategic stability has been on the fast flyers, been on the ballistic missiles, for good reason, through time.

As the President's letter today points out the B–2, their air-breathing leg, is the most stabilizing element of the strategic triad, and I would presume therefore the one we would want to hold on to the end.

On the cost side, that also has to be put in perspective. It has been a very expensive proposition to develop this airplane, there is no doubt about that. Many other programs are enjoying the benefits of what has been achieved in the B–2 development, including other aircraft programs that the Department of Defense is pursuing in other services in addition to the Air Force. Modern manufacturing technology developed here are changing the way that all future aircraft are going to be developed. So it has been very costly to develop it, plus big airplanes are expensive.

We are where we are today—the opposition proposals are that we should run the funding from the $27 billion that Congress has already appropriated out to $35.5 billion in order to field 15 airplanes. Beyond that, it takes $27 billion more to field a robust capability, military capability, rather than simply a robust test force, and on a cost-to-go basis, this program is now down to somewhere, depending on exactly what you assume about some other programs, between the 7th and 10th largest defense program in terms of cost.

So the unit costs are high. Since we have changed that program in light of the changes in the world you were alluding to, we have decided we can satisfy our requirement with a significantly smaller

number of them, and therefore that development cost gets spread over a smaller number of airplanes.

The cost to go, once the development is completed, which both houses of the Congress are clearly committed to, the cost to produce this airplane on a unit cost basis is about twice what a 747 costs. The 747 obviously does not embody anything like the military capability that the B-2 brings, and it benefits from a production run of 700 airplanes.

So I do not think one can really make the case, given a recognition that the development cost was necessarily high for the monumental achievements that are there, I do not think one can really make the case that this airplane, to produce and deploy, is inappropriately expensive.

Senator MCCAIN. Well, I am sorry that I mentioned cost, because that consumed my remaining time. Mr. Chairman, are we going to have a second round?

Senator EXON. We are going to have a second round, Senator McCain.

Senator MCCAIN. Thank you, Mr. Chairman.

Senator EXON. We are now prepared to begin our second round of questioning.

Mr. Secretary, I said earlier that it was entirely appropriate—and I reemphasize that—for those to argue that we should go to a diad instead of a triad—I do not happen to concur with that, and obviously neither do you or the President or most of our military experts—but at least that is something that should be addressed.

If we can, though, let us get back to the problems that confront us. Certainly you know full well of the deep problems that the B-2 is in today, and the question comes, is it worth fighting for, notwithstanding overwhelming and, in my view, somewhat short-sighted opposition to it. But at least we have got to begin to straighten out the mess that we are in at the present time.

So certainly the Government, I think you would agree, has the power to either suspend or debar any of our defense contractors, and possibly that is upcoming for Northrop. If Northrop, in your opinion or in the opinion of the various investigations that are ongoing at this time, has done things, as I think they have, which may have criminal implications in addition to just faulty management, then we should take that course.

In taking that course, though, I suspect that you, as the Secretary of the Air Force, have to say, well, what happens then. We get our pound of flesh, but what happens then with the national security interest of the United States? That is the dilemma I think we face. Certainly Northrop has many well-documented problems going back over a number of years with the MX guidance system, the TACIT RAINBOW proposition, and certainly now the B-2.

Northrop is basically the sole producer of many important defense programs, and I think we have got to keep that in mind. But how far will this mismanagement and/or illegal activity, if it proves out to be that, have to go before you move to suspend or debar Northrop from any current and future contracts with the Government? If suspension is not justified at this time, when do you think appropriate suspension action could be taken or possibly the elimination of some of the incremental progress payments that

are made to Northrop is necessary to halt what has been a pattern of not being forthcoming?

Secretary RICE. Well, Senator Exon, let me say a little bit by way of background on the suspension and debarment process. We have an ongoing review, as I think you are aware. One division of Northrop, which is the one where criminal activities were uncovered and where the Department of Justice worked out a plea bargain arrangement to plead guilty to a number of accounts and extracted what I believe is the largest fine that they have ever gotten—I think it was $17 million. That division has been under suspension for, I believe, now over a year, and we are continuing to work to try to assure ourselves that that division can and would have returned to responsible status before we would lift that suspension.

There are some complicated aspects of that investigation. They continue to go on. If we find evidence that the problems there flowed beyond that division, which we have not found so far, if we were to find evidence that the problems there flowed beyond that division to other parts of Northrop, we would obviously have to act appropriately in response to that.

That is not the circumstance at the moment, and we are continuing to be focused on that Precision Products Division, but we are looking more broadly at the ethics and integrity programs of the entire corporation. That is being reviewed.

I might mention the MX guidance system. You know, there were problems in that earlier. It has done very well indeed in its tests lately.

You mentioned the TACIT RAINBOW program. It has not been doing well in its tests, and that is one where again we have an ongoing review that is looking at the full range of options, to include the possibility of program termination. There is a case where we have a very significant military requirement for that kind of capability, and if we should have to conclude that this program is not going to make it, then we have the task of working out how we move from there to an alternative way to try to provide for that important military capability.

You also mentioned the B–2 program, but I think I have spoken to that already. I would mention one other thing in this connection, and that is that I think there is sometimes a feeling around that somehow Northrop has kind of skated through all of this. In addition to the reviews that we have been talking about, the pressures we have had on them about management improvement, the suspension of one division, which has cost them a significant amount of business, including the opportunity to compete for a new generation gyro system.

Northrop has in fact lost an important piece of business based on assessment of their performance as a contractor. We have in place, since 1988, I believe, a formalized process of reviewing the performance of contractors and putting that information into our source selection process, and there is one case already where another company was brought in as a potential competitor and Northrop, based on an assessment of their performance, lost out in that case.

So a significant piece of business has gone to one of their major competitors in the past year directly as a result of our ongoing as-

sessment of how they are doing. So they have not skated through this whole business without any effect on them.

Senator EXON. Just one last question on that general subject. I recognize, Mr. Secretary, that most of these problems did not happen during your "watch," so to speak. But, nevertheless, as Secretary of the Air Force you have to deal with them right now, and you have major responsibilities in this area.

In July it was reported that the Justice Department officials investigating the allegations against Northrop found that in 1988 the Air Force had been "fully aware" for years that the contractor was providing inaccurate cost and schedule information on the B–2 program and knew about the cost overruns and the schedule delay.

According to the U.S. Attorney, Howard Daniels, as a result the Justice Department would not be able to claim false representation to the Air Force in any case alleging fraud by Northrop. Secretary Rice, how do you respond and how can you respond to this report? Has the Air Force knowledge and resulting inaction, in your opinion, prevented the Justice Department from properly investigating and effectively prosecuting Northrop?

Secretary RICE. As best I can look back and reconstruct what all has gone on there, Mr. Chairman, I do not believe that that is a valid conclusion the way you put it. There was a claim brought, as I remember, that the cost, schedule and control system in Northrop was not properly operative and that the cost projections that it produced were therefore inaccurate. That information was then used as the basis for a contention or charge, if you will, that Northrop was somehow defrauding the Government as a result.

What the investigation showed was that yes, it was true that the cost, schedule and control system, a management information system, was not up to snuff, but what was not true was that it was not true that the Government was relying on the information that came out of that system for any decision purpose, and that the Government was fully aware of the actual costs incurred—those were being accurately recorded—and was able to make its own independent assessments and estimates of what future costs would be based on the actual data that was available and was accurate and our experience with other programs.

So I think the way to characterize that is there was no basis and the underlying basis on which that charge was brought was simply mistaken. It had presumed from the beginning that because this management information system was not up to snuff—that itself was a problem; that was a contract obligation and something that was supposed to be working properly, but it was not—but the charge assumed that because that management information system was not up to snuff that that resulted in a defrauding action of some kind. That I think simply did not hold up when it was looked into.

Senator EXON. Are you convinced, Mr. Secretary, that the current management of the Northrop Corporation after the changes that they have gone through are capable and honest with the Government, as obviously the ones in the past were not?

Secretary RICE. Mr. Chairman, I am comfortable that Mr. Kresa, the new chief executive officer, and Mr. Boileaux, the new manager of the B–2 division, both of whom are experienced senior executives

whom I have known personally for some time, are competent, capable, honest managers. I would not try to pretend to speak for every individual in a major corporation with 30,000 to 50,000 employees.

Senator EXON. I was talking about top management now.

Secretary RICE. I do know those two individuals personally, and I believe they represent significant experience and capability in those roles, and we can see the evidence that since they have been in their roles there is clear improvement in the management systems and the results of the kind of reviews which we are here to talk about and in the actual performance on the programs.

There are still some programs there, one of which we mentioned earlier, that are in trouble. That trouble is not entirely of Northrop's making. I have no doubt that better management there would have made things somewhat better, but the fact is that we and earlier generations in the Defense Department went into these fixed price development contracts on complex new developments, pushing the state of the art, sometimes depending on information to be provided from the Government which the Government in fact did not have and could not make available.

There are a lot of ramifications that are involved when we look at some of the classified programs, one in particular, TACIT RAINBOW. So I think that is very much a two-sided problem, and that is the mess we have inherited, if you will, as you pointed out earlier, and what we are trying to work our way through. The contractor is part of the problem, but so is the Government in that case.

Chairman NUNN. Does that cut across service lines? Does the Navy not have exactly the same problem, if not more, with those fixed price development contracts?

Secretary RICE. I believe that is correct, Mr. Chairman. It certainly does cut across service lines. I am not personally deeply into that. I think you probably are referring to the Navy A-12 program, among others, and I think that is certainly right.

Chairman NUNN. The P-7 program?

Secretary RICE. Yes, exactly. It was a philosophy of contracting and acquisition management some years ago which we now believe to have been seriously flawed.

Senator EXON. Thank you, Mr. Secretary. Senator Thurmond.

Senator THURMOND. Dr. Rice, I believe you discussed the cost of the B-2 in response to an earlier question. My concern is what the impact this high cost will have on our declining defense budget, and if we will end up having to make a choice between funding the C-17, advance tactical fighter, or the B-2, at some future date to make budget ceilings.

Secretary RICE. Senator Thurmond, I do not believe we will be forced to choose one or the other. One of the major outcomes of the Secretary's major aircraft review process was to adjust all of those programs, the Navy A-12 program as well, to change quantities, adjust schedules, set them at points in time so there is less conflict and overlap from a budgetary requirements point of view.

I think we are now in a position, perhaps with minor adjustments as we go on, to be able to afford those systems within the reduced defense budgets that we are looking at today.

Senator THURMOND. Secretary Rice, accounts on the Air Force probe give the impression of a company in chaos. Based on your

personal review of the situation, how would you characterize the operations and management of the Northrop Corporation?

Secretary RICE. Senator, I think, as I have tried to characterize it, we are seeing the effects of the growing pains associated with a company changing from a $1 to $22 billion-per-year company to a $6 billion-per-year company combined with changing roles from principally a subcontractor to a major prime contractor with very advanced technology and complex systems.

As I said in my statement earlier in response to a different question, I think that we have to say that we would have preferred to see some of these problems dealt with earlier, but they are now being dealt with. So I would characterize the overall situation as one that is clearly improving, and I believe with the continued effort of the Northrop top management and the Air Force oversight that we will successfully conduct the programs that are entrusted to that management.

Senator THURMOND. From what you say, I feel you are of the opinion that there have been some concrete improvements in the B–2 program generated by Northrop's management.

Secretary RICE. Yes, sir.

Senator THURMOND. Are you familiar with any successes that point out the accomplishments of the Northrop management?

Secretary RICE. I mentioned a couple earlier. The new management of the B–2 division has put a very important systems engineering process in place. They have focused on the transition from development into production and improved the operations there. The overall program has very impressive technical accomplishments in it almost across the board. Those things do not happen automatically, either. Obviously that is where a lot of the management focus has been.

I think another way to interpret kind of what we have seen in this management review is that this company has really put its primary emphasis and its best talent on technical achievement, and it has done that very impressively. It has not done as well at the kind of ongoing administrative, business management aspects of conducting such a large complex program or a set of large complex programs and administering the flow process over time of carrying them out. The weaknesses have been in those latter administrative areas and much less so in the technical areas.

So there are many areas of great accomplishment that lie alongside these weaknesses that we have found.

Senator THURMOND. I understand, Mr. Secretary, there are a number of program milestones in which you are interested: quality milestones; production milestones; and program management milestones.

Is there a cost accounting milestone, and how well do you feel Northrop would do on that?

Secretary RICE. Yes, sir. I could provide you more details on that for the record if you would like, but there are cost accounting milestones. We are tracking their actual costs incurred very carefully as we go, and that is on track toward the overall program estimates that we have laid out for the committee earlier this year.

[The information follows:]

On October 11, 1990 the Secretary of the Air Force was asked to provide this information to the committee by October 26 to meet printing schedules. Two extensions on this deadline were granted. Despite the two extensions, the Air Force failed to provide the requested information, and there was no indication when the material would be provided. On November 13 the committee proceeded to print this transcript. When provided, the answer to this question will be retained in the committee's files.

Senator THURMOND. I would like to ask this question of you, and I am sure you will take it in the spirit in which it is asked.

Was this review an adversary proceeding, or was it a joint Air Force-Northrop attempt to make things better?

Secretary RICE. I would say it was part of an ongoing process which is a joint effort to make things better. This particular part was not adversarial. It was not jointly initiated in the sense that the Air Force service acquisition executive initiated it, but the Northrop management cooperated fully with it, opened up all of their records, made their people available for interviews and all of that, and then received the results in the kind of open-minded spirit we would have wanted.

Senator THURMOND. So things have reached the point now where you feel they have improved enough that you can continue to go forward in working with the company?

Secretary RICE. Yes, sir, on these programs. We still have these other investigations going on, and we will have to work the results of them, depending on how they come out.

Senator THURMOND. Thank you very much.

Senator EXON. Thank you, Senator Thurmond. Senator Nunn.

Chairman NUNN. Thank you, Mr. Chairman.

Mr. Secretary, in your letter to the committee last June you indicated that as a result of congressional actions holding production of B–2s to a very low rate over the last 4 years and also the Air Force and Department of Defense actions in cutting down the numbers of B–2s that the Air Force has now incurred a potential unfunded liability of about $1.4 billion on the 10 production B–2s already authorized. Is that correct?

Secretary RICE. Yes, Senator, that is correct.

Chairman NUNN. Since the bill that has passed the House and is in conference which we are negotiating now directs the completion of both the flight test aircraft and the production B–2s currently under construction, would the House bill have to provide at least $1.4 billion in procurement funding for fiscal year 1991 to accomplish their own mandate with no planes on order?

Secretary RICE. I believe that is accurate, Mr. Chairman. I can check that number for you for the record if you would like.

[The information follows:]

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I recall that the total estimated amount that would have to be appropriated under the House proposal would be $35.4 billion to

finish the program, finish the RDT&E and to actually field the 15 aircraft.

Chairman NUNN. If the House bill's B–2 provision became law, if we were to accept that provision in conference, what is your estimate of the termination costs the Air Force would incur? How much would it cost legally to get the House bill fully implemented, which means to basically end the B–2 program but complete what is under way?

Secretary RICE. That is all incorporated in our estimate of a total of $35.4 billion. The Congress has appropriated about $27 billion so far, so it is $8 billion plus to go to complete that provision as the House has laid it out. That is made up of a combination of the remaining RDT&E requirements and the termination cost. The termination cost, as I remember, is in the range of several billion dollars, but I would have to get you the exact number for the record if you like.

[The information follows:]

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Chairman NUNN. So you are talking about approximately $8 billion to basically phase the program out and not really provide more production aircraft?

Secretary RICE. That is right, sir. The Congress would have to appropriate, I believe, in excess of $8 billion starting from fiscal year 1991 forward to implement the House recommendation.

Chairman NUNN. We would have, then, how many aircraft?

Secretary RICE. We would have 15 aircraft.

Chairman NUNN. 15 aircraft for $35 billion?

Secretary RICE. Yes, sir.

Chairman NUNN. So, if we would go along with the House provision, we would have $2.3 billion per plane?

Secretary RICE. Yes, sir.

Chairman NUNN. So when people are talking about the per-plane cost, the highest per-plane cost for the B–2 would be the House provision?

Secretary RICE. Yes, sir. The best way to lower the per-plane cost, Mr. Chairman, is to buy more of them; there is no doubt about that.

Chairman NUNN. Buy more planes. Of course, that costs you more money.

Secretary RICE. Yes, sir, but it lowers the per-plane cost if that is the only objective.

Chairman NUNN. Let me ask you one other question. You have spent $27 billion—and this is what I think the American people really have not understood because it has not been explained in a clear way—on the B–2. If we were to walk away from it now and basically say to the contractor we are not going to pay you any more even if we legally owe it to you—in other words, if you said right now we are cutting it all off and you just go to court and sue

the Government; of course, they would prevail on a number of the suits and we know that—but if you cut it off right now you would have already spent $27 billion. Right?

Secretary RICE. $27 billion has been appropriated, Senator Nunn. Because of some of the gates that are in the program and the pace of it, not all of that has been obligated yet. If you were actually to cut things off cold turkey today, it might be more like $24 billion that would actually have been expended to get out of the program.

Chairman NUNN. So when we see the per-unit cost of the aircraft——

Secretary RICE. That would get zero aircraft.

Chairman NUNN. That would get zero aircraft, so we would have zero aircraft for $24 billion.

Secretary RICE. That is right.

Chairman NUNN. Now, what has that $24 billion been used for? What could we say to the American people they have bought for the $24 billion, if we stopped everything right now?

Secretary RICE. They have bought a monumental advance in aircraft technology that combines high payload range with stealth, so that you have a system that can obviate air defenses and operate across great ranges, in fact operate with near impunity anywhere in the world.

It has also produced major advances in subsystem technologies and in manufacturing technologies and in materials that are already showing their fruit in other defense programs and, in fact, some of the composite materials and other things are already being examined and considered for application in commercial aircraft and perhaps even for other high strength plastics applications in the commercial world.

The CAD/CAM manufacturing technology will change the way that every future aircraft is produced and will spread to many other areas of manufacturing technology.

Chairman NUNN. You are talking about having spent $24 billion, but really and truly that is not just for the B–2. It permeates the whole system of stealth technology through all the services, and that is indeed revolutionary technology that gives America the upper edge in a whole host of weapons systems versus the Soviet Union or any other potential adversary in the world. Is that not correct?

Secretary RICE. That is right, sir. We could not be pursuing the level of stealth and other technologies that we are planning to embody in follow-on aircraft programs without that investment.

Chairman NUNN. Would that apply to the ATF, the new fighter aircraft?

Secretary RICE. The ATF. It certainly applies to the A–12, ATA program.

Chairman NUNN. That is the Navy aircraft.

Secretary RICE. The Navy A–12, of which the ATA would be an Air Force variant down the road. And it applies to the ATF, yes, sir. And it applies in fact to a number of smaller stealthy vehicles, some of which are highly classified.

Chairman NUNN. So what is the program now, 72 aircraft you are talking about now?

Secretary RICE. 75 aircraft.

Chairman NUNN. 75 aircraft. Divide that into $24 billion, roughly is, what, $350 million a plane, $330 million, something like that?

Secretary RICE. Right.

Chairman NUNN. That much is going to be in the planes in every per-unit cost anyone sees of how much the B–2 costs. Twenty-four billion, or approximately $330 million to $340 million per aircraft, is already spent, and that is research and development money that applies not only to the B–2 but in every system virtually from now on that will have stealth technology.

Secretary RICE. It is R&D money and the early production monies.

Chairman NUNN. But it goes across a lot of other systems.

Secretary RICE. Yes, indeed, as would the remaining RDT&E money that has yet to be appropriated and obligated.

Chairman NUNN. Bottom line, Mr. Secretary, can this committee and can the Congress of the United States entrust the Air Force and Northrop to spend the taxpayers' money effectively and efficiently on the B–2 from this point forward?

Secretary RICE. I believe we can, Mr. Chairman.

Chairman NUNN. Thank you, Mr. Chairman.

Senator EXON. Senator Nunn, thank you very much, and thank you for your leadership, your patience and your understanding of the overall problem that we are wrestling with.

Let me follow up to Senator Nunn's last question once again. It is somewhat redundant, Mr. Rice, but we as a committee, Congress as a whole, the American people, who are the ones who are going to pay for this in the end, have to be assured without any doubt whatsoever that there have been significant changes in the top management of the Northrop Corporation as we try and work out of the past difficulties that we all recognize that Northrop has had.

Let me ask you this question once again, and it goes to the matter of credibility, which is what we need very badly. The President's letter to me this morning is ~~of~~ great help in that area. But following up once again on what Senator Nunn said, without equivocation can you tell us—and we have a lot of confidence in you, Mr. Secretary—that you have the ultimate in confidence as of today of the top management of the Northrop Corporation, and in your best judgment now have in place the management personnel that are going to straighten out the past programs and, above all else, be honest and straightforward?

Secretary RICE. Again, Mr. Chairman, I can speak about the two individuals who have the two key positions—the CEO of the corporation and the head of the B–2 division. I know those gentlemen personally. I have observed their performance as they have come into these new roles, and I think we have every reason to have exactly the kind of confidence you ask about in them and their performance.

I would not try to speak to every member of the entire management team and all of the people in such a large organization. It would be remarkable if there were not a bad apple in that large a barrel someplace.

Senator EXON. Well, Mr. Secretary, following up further on that, I think it is clear that you have confidence in the what I call top management of the company. You said you know one or two of

these individuals very well. And evidently you have confidence in them. But you seemingly lack some confidence in those who serve below them.

Given that, should the Air Force be increasing the level of auditors and other oversight specialists——

Secretary RICE. Mr. Chairman, I do not want to express a lack of confidence, but you asked a very important question, and I did not want to have my positive response to it extend to areas of which I do not have personal direct knowledge.

Senator EXON. I go back to my question once again that goes to the very area that you and I have some concerns about. Do we need to have more Air Force personnel, either in blue uniforms or civilians, operating as auditors and oversight specialists at Northrop in all of their plants in order to increase the degree of Air Force oversight? Should we in the Congress be requesting a larger presence by the General Accounting Office at Northrop facilities?

You know, I know that too many people looking over too many people's shoulders tends to be less efficient than it otherwise might be, but I think efficiency and honesty have not been the hallmarks of the Northrop Corporation in the past. So I am asking you do you think we need more oversight there to make sure that the lower management in that corporation is performing up to speed?

Secretary RICE. No, sir, I do not. There is a significant level—it has grown—of such oversight. The GAO has resident people in the program office for this program. Many elements of the Department of Defense are engaged in the ongoing reviews on the ethics and integrity side. I believe we have a strong, competent program manager in place. I know that Jack Welch is personally deeply involved with this program every step of the way. I think there is adequate oversight.

Now I might even worry that it has begun to swing to the point that you alluded to, where we might be bumping into each other.

Senator EXON. Let us get back to some specifics. As you know, there are—and we have talked about it—deep differences in the funding levels for the B–2, which is essentially terminated or canceled by the House of Representatives. Specifically, there is $2.9 billion difference in funding between that recommended by the House and that recommended by the Senate Armed Services Committee, and we are in intense negotiations on that right now and have had numerous meetings—I forget how many—on it just in the last week.

That $2.9 billion difference is essentially for 2 additional aircraft purchases, with some fences around it that are going to be placed in to make sure, as best we can, that the money is wisely used.

Given that, how much, if any, cut do you think could be made in that $2.9 billion difference between the House and Senate figures, given the realities of the situation?

Secretary RICE. Well, Mr. Chairman, the $2.9 billion I believe is made up of almost $2 billion for the 2 aircraft, about $700 million in advance procurement for 6 aircraft for next year, and about $200 million of difference in the RDT&E line. I think that will add up to the total of the $2.9 billion you are talking about.

Unfortunately I do not like to have to give you this answer, but unfortunately I think when we did the Major Aircraft Review and

adjusted the total quantity for the program, cutback on the number requested for fiscal year 1991 and rephased the program so that the actual peak funding that has to be required in any given year is much lower than it was under the old 132-aircraft program, I think we have taken it to the rock bottom.

Now, if you cut it further, if you cut the funding further this year or do not authorize both aircraft, that will simply roll forward and either start a new train of unfunded liabilities growing or it will further increase the actual cost of the program as we go down the road.

So we have looked at this six ways from Sunday and cannot find a way to reduce the dollar requirement in 1991 without paying the piper down the road.

Senator EXON. In other words, you are saying it would be penny-wise and pound-foolish to go below the Senate numbers?

Secretary RICE. Yes, sir.

Senator EXON. Well I congratulate you on your candor on this matter. Normally, as you know, we anticipate up here that some of the recommendations that come to us from the administration sources, including the Department of Defense, have somewhat higher numbers. But they anticipate that we will boil them down some and not give them quite as much.

I guess what you are saying is, at least in the case of the B–2, without question in your judgment there is no bidding going on here. You were straightforward and honest with it. This is the lowest highly-scrubbed number that you presented to us, which is the bottom line and not the opening bid.

Secretary RICE. Yes, sir, to the best of my knowledge that is exactly right. The original fiscal year 1991 budget position, as you remember, requested four aircraft. And this is already scrubbed down from that to two. And we just do not see a way to go lower without, as you say, ending up being penny-wise and pound-foolish.

Senator EXON. Again, I appreciate your honesty and candor. It would be easier for us had you come in with the four and then we could have come down to the two. But I appreciate your straightforwardness. Senator Nunn.

Chairman NUNN. When you have got Congress in a position that there is nothing to split, that makes it very hard to compromise.

Secretary RICE. I will carry that message back, sir.

Chairman NUNN. Mr. Secretary, I think you have answered most of my questions. I just have a couple more.

As you know, we are dealing right now with a House bill and a Senate bill. The Senate bill basically provides the funding that the administration has requested. But we set up a series of benchmarks that do not let you make certain expenditures until you have proven the technology.

When do you believe that we will have high confidence that the Stealth technology itself is going to work, and that is technology based on actual tests?

Secretary RICE. Mr. Chairman, the tests will begin before the end of this year. I believe that the first few test flights will tell us a great deal. We have, as you know, many, many hours of pole model tests and a great deal of confirmation of our estimating models and calculations based on other Stealth systems that have actually

been tested in operational configuration. So we have a lot of reason to have high confidence that we are going to get the results that we projected.

In those early tests you will, assuming they come out as projected, you will then have a very important validation of the models and the fundamental calculations. We will not yet have checked out every aspect, every frequency of energy that might be applied to the system. And in order to do that, to clear out that whole envelope of radar cross section testing, is what takes so long. It will take a long time to track through that.

But the early tests will give us very important validation, fundamental validation of what, up until now, can only be estimates based on the calculating models. And it will also go to some of the most important threat frequencies.

So we will have a big step function in my view in what we know based on this next round of testing, which will take—I believe we are expecting to complete it in the course of 2 months or 3 months of flying and then perhaps a month or 6 weeks of data analysis and so on after that.

Chairman NUNN. Are you talking about by next spring?

Secretary RICE. The spring of next year, I think, should be a confident number.

Chairman NUNN. Mr. Secretary, we have some Stealth fighters, the F-117, in Saudi Arabia now. Is that correct?

Secretary RICE. Yes, sir.

Chairman NUNN. Is the number that are there classified?

Secretary RICE. I believe it is, sir.

Chairman NUNN. There have been news articles that basically indicate that Stealth fighters, not the B-2, we are not talking about that, we are talking about the plane that we already have——

Secretary RICE. The F-117.

Chairman NUNN [continuing]. The F-117, that that has been picked up by radar. Could you comment on that? There is some French radar that supposedly has picked up that Stealth fighter.

Secretary RICE. There was a report in a French aviation magazine which was then picked up and repeated in the media here in the United States that a French-made air defense system, the radar associated with an air defense system that had been sold to Saudi Arabia had detected the F-117 in flight. And it gave a detection range of 10.5 miles, I think was what was reported.

We checked into that and found that that report is accurate. But it is accurate because the airplane is flying with two antennas extended and a rotating beacon under its nose expressly for the purpose of making sure that in its normal training configurations over there it can be seen by radar.

Chairman NUNN. In other words, it would be pretty dangerous flying around Saudi Arabia with all those planes over there if nobody can see you, right?

Secretary RICE. Absolutely.

Chairman NUNN. The fact that you cannot see it does not mean you cannot hit it if you are in midair, right?

Secretary RICE. Yes, sir. But when it goes to war it will be in a different configuration and that radar system will not find it.

Chairman NUNN. So basically it has certain mechanisms that can allow it to be seen for safety purposes in a heavy air traffic situation.

Secretary RICE. When it flies in regular training in the United States it has even additional enhancers that are part of the system that allows it to be seen even more easily. By extending a couple of antennas that are built into the aircraft and using this rotating beacon, it gets into a sufficiently non-Stealth configuration, shall we say, as to be safe for training operations.

Chairman NUNN. It is a totally different mode when you go to war.

Secretary RICE. Yes, sir.

Chairman NUNN. Do you have any reason to believe that the F-117 is now vulnerable to any radar in its wartime configuration?

Secretary RICE. No, sir.

Chairman NUNN. Mr. Secretary, as you know the House bill provides no procurement funds for the B-2, directs the Air Force to stop production at the 15 B-2s now on order that are in the mill, and directs you to, and I quote from the House bill, "preserve the production facilities and the tooling for production of B-2 aircraft so as to maintain a production option."

Have you calculated the cost to the taxpayer of preserving the production facilities and the tooling so that the program could be restarted if needed? In other words, have you costed out what the House bill would cost in order to implement?

Secretary RICE. I am sure our staff is working on those, Mr. Chairman. I do not have those numbers, but I know enough about it to know that it would be a large cost indeed and would have to be paid on a recurring basis, annually or for as long as that capability were intended to be kept open.

Chairman NUNN. Could you get for us, and we really need it some time this afternoon, if possible, the costing out of the House bill?

Secretary RICE. I will provide you the best estimate we have at this point. That is not a circumstance with which we have a great deal of experience and so we will have to make the best estimate we can of what would be involved in it.

[The information follows:]

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Chairman NUNN. Thank you.

I want to thank you, Senator Exon, for having the hearing. This is, I think, very meaningful and very timely.

Mr. Secretary, thank you very much for your testimony.

Senator EXON. Thank you, Senator Nunn.

Let me just comment for the record. When you talk about the stealthiness of either the Stealth fighter or the B-2 bomber, we keep talking about the term invisible or radar-detectable.

The facts of the matter are that both the fighter, if it were configured for combat situations as you very appropriately pointed out, Mr. Secretary, or the B–2, from what we know of it today—and the tests are going forward—would be so undetectable by any known radar, including the French, any known radar today, that while at certain ranges the radar might pick up that something is there. But that is only part of the effectiveness of defensive techniques to destroy that system.

The point is that we should not let it be said that either the Stealth fighter or the Stealth bomber are totally invisible to radar because we have known from the beginning that under some conditions they would not be. But the facts of the matter are that no one has been able to come up with any kind of a reasonable scenario at this juncture to indicate that countermeasures could be taken to destroy or stop such aircraft from performing their mission under combat conditions. Is that correct?

Secretary RICE. Yes, sir. I think what you are getting at is that to defeat a stealthy system not only requires some ability to detect it, to be aware that there is something out there, but some capability then to track it and to hand off that track to whatever is going to engage it—whether that is an aircraft or a missile system or whatever—and then for that to acquire it and to be able to guide whatever it is that is going to attack it into close proximity. Then it has to fuse.

All those things require not just detection, but continuous detection and awareness of the stealthy vehicle being there.

Stealth defeats every one of those steps. So the likelihood that you can string them all together becomes very, very low indeed.

Senator EXON. Thank you very much, Secretary Rice.

Senator McCain has been very patient. He has now returned and I am pleased to recognize him.

Senator MCCAIN. Thank you very much, Mr. Chairman. I thank you for chairing this very important hearing.

Obviously there has been a great deal of discussion and controversy surrounding this issue. I think this hearing has been very helpful to me and the entire committee.

Mr. Secretary, let me just get back to my previous question. What would be the role of the B–2 in the Middle East? I do not believe that would be classified.

Secretary RICE. Let me put it this way. There are some aspects that one could get into that could quickly become classified, Senator McCain. But I think that it clearly would have offered the capability without worrying about large escort packages or large support packages to help it deal with air defense systems, which current generation aircraft require.

It would have had the ability, without those kind of supporting assets, to hold any target at risk from day 1. So it would have plugged the gap that was there in the very earliest stages of this current contingency. And today's long-range conventional bombers can plug that gap, too, but at much greater risk unless they take along with them significant supporting assets.

I think you are familiar with what I am referring to. We saw that, for example, in the Libya raid. In the ongoing scenario they will have the opportunity, the capability, as our current heavy

bombers do, to be employed as part of an integrated air campaign or separately as part of specific strike options.

At the behest of the President and the CINC involved, the current generation of heavy bombers are deployed. And some are even ready here in the United States to be used in such a way should the kind of capabilities that they offer, the high payload range features that they have today, even without Stealth, be called upon in the plan. And some of them are being integrated into the operational planning that is going on right this minute.

Senator MCCAIN. Well, we strayed a bit from the Middle East scenario.

Secretary RICE. No, sir. Everything I had to say was with reference specifically to this current scenario. I just tried to say it in general ways.

Senator MCCAIN. I was under the impression that the Stealth fighter could take care of the role, at least part of the role, that you envisioned. But what I am saying is I can make a strong argument for a B–52. I am gratified that they are there with the enormous capabilities that they have to deliver conventional weapons on target. My information is that the B–2 does not have anywhere near that conventional carrying capability.

Secretary RICE. No, sir. The B–2 has somewhere approximately double the conventional payload of a B–52.

Senator MCCAIN. In all 15 of them?

Secretary RICE. No, sir. One aircraft to one aircraft.

Senator MCCAIN. I mean all 15 aircraft. At a cost of roughly 20 times to 30 times the cost.

Anyway, I think that the B–52s——

Secretary RICE. The issue is survival against modern air defenses, Senator McCain. That is what the Stealth capability gives us. And it happens that what we have done in the B–2 is to do even better at payload range than the B–52 does, by substantial margins. The B–2 would deliver larger payloads over longer distances with less tanker support than the B–52. And it would do it against sophisticated air defenses, which the B–52 cannot do.

Senator MCCAIN. Since the B–52 is about 40 years old, I understand that. But in my view we developed the support aircraft, including the Stealth fighter, to take care of the escort problems that you were describing.

Did Northrop fail to keep subcontractors apprised of critical design changes that could affect the B–2 performance as the Post claims?

Secretary RICE. I believe, Senator McCain—I do not know what the Post claim was based on. The point that was discovered or uncovered, if you will, in the review or made by the review was that the management processes for the transfer of design changes on a timely basis with all the data and information that has to go with them to subcontractors was a management process that was deemed to need improvement.

Where there have been slippages of that sort it has not affected the performance of the program. It has affected the schedule and the time and the amount of effort that has had to be taken to get those design changes incorporated into the program.

Senator MCCAIN. So Northrop did keep the contractors apprised of critical design changes?

Secretary RICE. As far as I am aware, they have done that, but not always on as timely a basis as we would have preferred. That is an ongoing process, that is an issue with the ongoing process of the management of the program. It does not lead to performance problems in the airplane.

Senator MCCAIN. Is it true that new major problems have emerged in the radar warning receiver in electronic sweep for the B-1B as some publications have reported?

Secretary RICE. The tail warning function in the B-1B is having technical problems. We are still in the development, have not quite gotten to the testing mode yet, for the ALQ-161, I guess it is. That is the electronic countermeasure suite in the B-1, which, as you remember, we have had considerable trouble with.

We have a new program laid out which the Congress has supported. It is laid out on a zero concurrency basis. We are committed to completing the development and going thoroughly through the test program in assuring ourselves that we have something that works before any commitment is made to production of those articles.

It is a challenging proposition as we have known all along. We are very much in the middle of that process. And I really would not give you any sense that we think it will not work at this point. We have got to keep working on the development problem.

Senator MCCAIN. Do you have a sense that it will work?

Secretary RICE. I asked Jack Welch that question specifically about 10 days ago. He tells me he believes the problems can be solved and are being solved. But there are probably not unexpected kinds of difficulties in that development effort. It is a very challenging task.

Senator MCCAIN. Perhaps for the record you could provide the committee with how much money we have spent already in trying to correct this problem. I think it is in the hundreds of millions of dollars, which were unanticipated at the acquisition of the aircraft.

[The information follows:]

On October 11, 1990 the Secretary of the Air Force was asked to provide this information to the committee by October 26 to meet printing schedules. Two extensions on this deadline were granted. Despite the two extensions, the Air Force failed to provide the requested information, and there was no indication when the material would be provided. On November 13 the committee proceeded to print this transcript. When provided, the answer to this question will be retained in the committee's files.

Thank you very much, Mr. Chairman.

Thank you, Mr. Secretary.

Senator EXON. Thank you, Senator McCain.

Mr. Secretary, you have been very patient. I just have one last question. Then if you want to do any kind of a wrap-up, I will be glad to recognize you for that purpose.

Mr. Secretary, maybe by the strangest of coincidences, just before our defense authorization bill went to the Senate floor in early August, this very same House subcommittee that is releasing information to the press today, was making news about the B-2 of a very similar fashion to the recent stories that we have heard.

It appears that the subcommittee was claiming that the Air Force was being knowingly overcharged on the B–2 because billings were based on a Northrop cost and schedule control system that the Air Force knew was faulty. Is there any relationship between those earlier charges that were made and the news stories that broke this week? Or is this simply an old, smelly fish wrapped up in a new newspaper, so to speak.

Secretary RICE. Well, Mr. Chairman, as I mentioned earlier the cost schedule and control system was having problems. What was wrong about that earlier charge was that the Air Force was being charged or paying bills based on that system. That was simply not correct. And it was then that misunderstanding that was the basis for the charge that received so much notoriety.

It was nonetheless a deficiency under the contract terms to have a CSCS that was not working properly. It was not up to snuff. And that problem has been worked and in a sense fixed.

I think some of the reports that you have seen recently from the House subcommittee and the public press are dragging out that same old fish again. The specifics, of course, of the review that we have been telling you about here today was new material. But I would say the characterization of it that was offered, that certainly appeared in the Washington Post article, would not be one that I would consider an accurate and balanced characterization of that review.

Senator EXON. Mr. Secretary, thank you very much. There may well be additional questions for the record. Some of the questions that were asked today you have indicated that you would give us your earliest possible evaluation. I would hope that you could do as Senator Nunn has suggested in getting us those cost estimates today.

We would appreciate your responding as quickly as you can to any other questions.

In the meantime, thank you very much for being here, for an enlightening discussion on a difficult problem.

We are adjourned.

[Question for the record with answer supplied follow:]

QUESTION SUBMITTED BY SENATOR JOHN GLENN

STATUS OF B–2 FUNDING FOR FISCAL YEAR 1990

Senator GLENN. Secretary Rice, in fiscal year 1990, the Congress authorized $2 billion for the procurement of two B–2 aircraft. However, the obligation of that procurement money was withheld pending the completion of specific testing milestones that included the following restrictions:

None of the procurement money authorized for fiscal year 1990 may be obligated until the Secretary of Defense certifies the successful completion of Block One flight testing.

No more than 15 percent of the $2 billion procurement money authorized for fiscal year 1990 may be obligated until Block Two flight testing begins and the Secretary of Defense certifies to Congress that:

"The results of early Block Two flight testing (including testing of low-observables and flying qualities and performance) are satisfactory; and

No significant technical or operational problems have been identified during early Block Two flight testing."

Mr. Secretary, I understand that Block One flight testing is complete, but that Block Two flight testing has not yet started. Is this correct, and if so, am I correct in

assuming that there remains $2 billion in unobligated funds from fiscal year 1990 in the B-2 program?

[On October 12, 1990 the Secretary of the Air Force was asked to provide this information to the committee by October 26 to meet printing schedules. Two extensions on this deadline were granted. Despite the two extensions, the Air Force failed to provide the requested information, and there was no indication when the material would be provided. On November 13 the committee proceeded to print this transcript. When provided, the answer to this question will be retained in the committee's files.]

[Whereupon, at 12:12 p.m. the hearing was adjourned.]

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